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Partnerships for the Goals

Maano Ramutsindela
David Mickler *Editors*

Africa and the Sustainable Development Goals

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Editors

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Foreword

Africa's development aspirations are embedded in the 2030 Agenda for Sustainable Development and the African Union's Agenda 2063—the blueprint for the continent's transformation covering the period 2013–2063. These aligned Agendas offer a unique opportunity for Africa to achieve inclusive, transformative and sustainable development. They call for all segments of African society to work together to build a prosperous, peaceful and united Africa, the 'Africa We Want', where 'no one is left behind'.

Given the comprehensive and integrated nature of the 2030 Agenda for sustainable development, its effective implementation requires an 'all-hands-on-deck' approach, including the involvement of a wide spectrum of stakeholders such as the Member States, the United Nations System, African regional organisations, private sector, civil society organisations, local governments as well as academia and think tanks.

This book, *Africa and the Sustainable Development Goals*, is a perfect example of collaboration between African and non-African academics coming together in the true spirit espoused in SDG 17, highlighting the role of collaborative research in realising the SDGs. It brings evidence-based research to the forefront of implementing the SDGs, covering various key topics ranging from analysis of the best development approaches, industrialization, natural resources governance and public finance to health, employment and the role of women and young people. It touches on crucial aspects such as the need for quality data to draw policymakers' attention to critical areas likely to yield positive outcomes in achieving the goals of the SDGs.

The book's release couldn't be timelier especially with the approach of the first 5-year mark of implementing the SDGs. It identifies opportunities and constraints to the implementation of the SDGs, including the nature of the global capitalist economy, governance of natural resources and the structure of global governance highlighting the potential limits they impose on Africa's development. It should be highlighted that there is a high degree of convergence between the 2030 Agenda and Agenda 2063 since Africa significantly contributed to the formulation of the SDGs through the Common African Position on the Post 2015 Development Agenda. African countries themselves recognise the imperative of pursuing a coherent and integrated approach to implementing the SDGs and the African Union's Agenda 2063 including through an integrated framework for monitoring and

evaluation. Through their participation in the Africa Regional Forum on Sustainable Development and the global High-Level Political Forum (HLPF) on Sustainable Development, they continue to review progress and challenges and identify lessons on best practices for an integrated implementation of the two agendas. This book makes a significant contribution to this process and I hope many readers, including African policymakers, development partners, United Nations officials, private sector actors and civil society organisations will find its insight invaluable in informing their own policy-making processes on the implementation of the SDGs.

I will conclude by expressing my sincere gratitude for Worldwide University Network's initiative to bring in African voices and for this wide reaching collaboration. It is my sincere hope that the network will continue to undertake further policy research work on critical areas of SDGs to help inform on approaches that work best for the effective and successful implementation of the goals in Africa. I particularly encourage African academics, especially young postgraduate and early career academics to further contribute to the advancement and achievement of the SDGs by bringing in their African perspectives, thus ensuring practical policies that positively influence the day-to-day lives of all Africans.

New York, USA

Bience Gawanas
Under-Secretary-General and Special
Adviser on Africa to the United Nations
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Preface

This volume is the product of a set of 'Global-Africa' research and education collaborations forged over several years through the Global Africa Group (GAG) of the Worldwide Universities Network (WUN). As a 23-university-member international research network, WUN fosters research collaborations across continents focusing on four global challenges: *Global higher education and research, Public health (non-communicable disease), Responding to climate change,* and *Understanding cultures.* Since 2015, the Network has worked to directly engage these research programmes with the United Nations 2030 Agenda for Sustainable Development. The WUN Global Africa Group, established in late 2015 and launched at the University of Ghana in 2017, is a cross-cutting and regionally-focused mechanism that enables the wider Network to develop 'Global-Africa' collaborations. These are defined as collaborations that have relevance for Africa's research and development agendas, are linked to international debates and scholarship, and involve dynamic and equal partnerships between the 3 African and 20 non-African university members of the Network in the setting of research priorities and in co-designing and co-producing research projects. Indeed, the GAG's strategy concentrates the Group's work on fostering African 'regional research hubs' centred upon the Network's three African member universities: the University of Ghana (West Africa), the University of Nairobi (East Africa) and the University of Cape Town (Southern Africa). In turn, other national and regional universities and institutions are invited into projects and activities through these regional hubs to enhance the Group's inclusiveness as well as its collective impact on science, society and policy.

As such, this volume can be understood, through one lens, as articulating with Sustainable Development Goal 17, which is to 'strengthen the means of implementation and revitalise the global partnership for development'. In particular, the volume could be read to contribute to target 17.16, which is to 'enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, particularly developing countries'. The Group therefore recognises the inequitable nature of the global system, including in the higher education and research sector, and works to counter structural conditions that inhibit the production of a more level playing field when it comes to research on sustainable development.

Going further, the Group seeks to work at the intersection of African and global development debates and agendas, and indeed to be a sustainable platform for engaging in critical thinking on such questions that shape 'Global-Africa' discourses, debates and policies.

The methodology for the collaborative research project that produced this volume reflects the principles to which the Global Africa Group subscribes. One of the principles relates to co-authorship. Each chapter was required to be co-conceived and co-authored with at least one of the co-authors based at a university on the African continent. This was an attempt to ensure the inclusion of Africa-based ideas, priorities and scholarship. The co-editors also sought and promoted gender balance as well as the inclusion of post-graduate and early career academics. The other principle was that at least one co-author for each chapter must be based at a WUN member university to reflect the Global Africa Group's leadership of the project.

Beyond these principles for co-authorship, the co-editors openly called for contributions that addressed one or more aspects of the SDGs as they relate to Africa but that also, in some way, speak to at least one of the three broad themes that are now represented in the book's parts: (i) Africa's Sustainable Development: Approaches, Institutions, Agendas; (ii) Scientific Evidence and Critical Thinking on the SDGs in Africa, and (iii) Africa and the SDGs: The Role of Collaborative Research. The result is a set of chapters that cut across numerous SDGs and regions of Africa, with a heavier focus on Eastern, Western and Southern Africa, reflecting the regional hubs model. By using this bottom-up methodology, we have a volume that articulates the core ideas and research priorities on Africa's sustainable development by African and non-African academics and practitioners working collaboratively through our international network.

The volume represents a major set of research collaborations, totalling 26 chapters co-authored by 81 individual contributors across five continents and with a Foreword by Ms. Bience Gawanas, Special Adviser on Africa to the United Nations Secretary-General and former African Union Commissioner for Social Affairs. Indicating the 'Global-Africa' nature of the volume, these contributors are from, respectively, WUN member universities in South Africa (Cape Town), Kenya (Nairobi), Ghana (Ghana), the Netherlands (Maastricht), Australia (Western Australia), the United Kingdom (Bristol, Leeds, Sheffield, York), Norway (Bergen), Hong Kong (Chinese University) as well as from non-WUN-member universities in South Africa (Stellenbosch, KwaZulu-Natal, Western Cape, Pretoria, Fort Hare, Rhodes), Nigeria (Taraba State, American), Ethiopia (Addis Ababa), Malawi (Mzuzu), Tanzania (Muhumbili), Mauritius (Mauritius), Australia (Queensland), the United Kingdom (Aberdeen, Hertfordshire, King's College London), the United States (Columbia), Canada (Saskatchewan) and Denmark (Aarhus). Also included are contributors from other types of institutions, including the Association of African Universities, East African Community, Council for Scientific and Industrial Research (Ghana), Institute for Occupational Medicine (UK), Maendeleo Group (South Africa), Ecorys International Development Unit (Netherlands) and National Museums Kenya.

The book project and its themes were discussed by participants at the workshops of the Global Africa Group held at the University of Ghana (June 2017), the University of Cape Town (December 2017) and the University of Nairobi (November 2018), as well as through a WUN public forum on 'Africa and Sustainable Development Agendas' held at the University of Western Australia on Africa Day, 25 May 2018. With this book, we hope to draw attention to Africa's development priorities, needs and aspirations as African governments and the international community seek to urgently implement the SDGs as a global agenda.

Cape Town, South Africa — Maano Ramutsindela
Perth, Australia — David Mickler
November 2018

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Finally, we would like to sincerely thank Ms. Bience Gawanas, the Special Adviser on Africa to the UN Secretary-General and former African Union Commissioner for Social Affairs, for generously giving us her time to engage with the manuscript and write the inspiring Foreword to the book.

Maano Ramutsindela
David Mickler

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1 Global Goals and African Development

Maano Ramutsindela and David Mickler

Abstract

The United Nations Sustainable Development Goals (SDGs), occupying a centre stage in the post-2015 development paradigms, raise important questions about how African development priorities and needs are situated within broader global agendas, and the impacts these agendas have on the well-being of people living on the continent. The aim of this chapter is to contribute to discussions and debates on the intersection between the SDGs and African development in the twenty-first century. African development has been a subject of scholarly debates and policy interventions by state and non-state actors for many years. Our intention in this chapter is to discuss African development in the context of the SDGs and through five themes relevant to this volume. The first theme tackles the question whether the SDGs compete with or compliment other development agendas on the continent. The second theme places the SDGs within the political economy of Africa's natural resources to argue that Africa's resources remain crucial for the global capitalist economy, and that this limits the promise of transforming the continent through the SDGs. The third theme draws the links between higher education institutions, networks, and African development, and also teases out the identity and developmental roles of African universities. While SDGs offer many opportunities for African development they also come with their own constraints. We explore these opportunities and constraints in theme four. The last theme, on climate–human–ecosystem interactions, draws attention to changing human–environment relations and their implications for global environmental solutions.

Keywords

African development · Political economy · African universities · Human–environment relations

1.1 Introduction

From their conception at the Rio+20 United Nations (UN) Conference in 2012 as universally applicable to all countries, the SDGs are underpinned by moral principles that are captured in the phrase, 'no one should be left behind'. It has been suggested that what makes the SDGs universal is that they epitomise a common global vision 'of

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progress towards a safe, just and sustainable space for all human beings to thrive on the planet' (Osborn et al. 2015, p. 2); they apply to developing, middle-income, and developed countries; and are a product of an open process, i.e. they were negotiated through the Open Working Group, which involved states, civil society, business, academics and citizens (Shettina 2016; Dodds et al. 2017). They also pay adequate attention to the social, economic and environmental dimensions of sustainability as well as their interconnectedness (Kanie et al. 2017). In her foreword to *Negotiating the Sustainable Development Goals: A transformational agenda for an insecure world* (2017) the former UN High Commissioner for Human Rights and also former President of Ireland, Mary Robinson, described the UN 2030 Agenda as 'a unique accomplishment owing to the scale of the vision, the ambition of the goals, how it was negotiated and due to its universal value' (Dodds et al. 2017, p. xiv). Unlike the earlier MDGs, which were formulated by the UN Secretariat (McArthur 2014), the SDGs were 'the largest public and multi-stakeholder consultations in UN history' (Kanie et al. 2017, p. 3).

Others see the SDGs as a form of 'cockpitism': the illusion that top-down steering by governments and intergovernmental organisations alone can address global problems (Hajer et al. 2015). It has been argued that what is required is to mobilise a wide range of actors and connect them to the universal goals of the SDGs through four perspectives: 'planetary boundaries' to stress the urgency of addressing environmental concerns and to target governments to take responsibility for (global) public goods; 'the safe and just operating space' to highlight the interconnectedness of social and environmental concerns and its distributive consequences; 'the energetic society' to benefit from the willingness of a broad group of actors worldwide to take action; and 'green competition' to stimulate innovation and new business practices (Hajer et al. 2015). Yet critical comments on the SDGs argue that they expand the 'reach, scope and influence of the aid industry as never seen before' (O'Riordan and Stulgaitis 2017, p. 84) and that they act as 'a veneer for failures to achieve meaningful binding multilateral agreements' (Kanie 2017, p. 5).

In this chapter, we aim to relate the global agenda articulated through the SDGs to African contexts. To achieve this, we frame the debates about African development through five themes; the goal being to make a contribution to the discussion on the SDGs and to provide context for this volume. The first theme tackles the question of whether SDGs compete with or compliment other development agendas on the continent. In the second theme, we place the SDGs within the political economy of Africa's natural resources to argue that Africa's resources remain crucial for the global capitalist economy, and that this limits the promise of transformation through the SDGs. The third theme draws the links between higher education institutions, networks, and African development. While the SDGs offer many opportunities for African development, they also come with their own constraints. We explore these opportunities and constraints in theme four. The last theme is on climate–human–ecosystem interactions.

1.2 Competing, Complimentary or Suspicious Agendas

The UN 2030 Agenda and African Union (AU) Agenda 2063 were endorsed in the same year, 2015. This coincidence raises questions about whose agenda is on the table. The question is important because there are always suspicions about development agendas in Africa and elsewhere in the Global South. In fact, some people call the SDGs 'suspicious development goals'.[1] The roots and pathways of the SDGs and Agenda 2063 are different. In brief, Dodds et al. (2017) write that the idea of the SDGs came from Colombia's Director of Economic, Social and Environmental Affairs at the Ministry of Foreign Affairs, Ms Paula Caballero. The proposal

[1] A phrase used by a member of the audience at a public forum on 'Africa and Sustainable Development Agendas' at the University of Western Australia on Africa Day, 25 May 2018.

emerged during the preparatory process for Rio +20. As a separate and informal idea, 'the SDGs were viewed as competing with the MDGs … [and] as a direct threat to countries that had invested in the MDGs … Developing countries feared that funding would be cut off if the agenda was going to be universally applicable' (Dodds et al. 2017, pp. 17–18). The principle of universality underpinning the proposal for the SDGs was given impetus at the 17th Conference of the Parties (COP17) held in Durban, South Africa, though the two were not linked. It is worth noting that African countries participated in the development of SDGs through the Open Working Group in which seats were allocated for the five different UN regions, namely Africa (7 seats), Asia and the Pacific (7 seats), Latin America and the Caribbean (6 seats), Western Europe and others (5 seats) and Eastern Europe (5 seats). The African Group membership of the Sustainable Development Goals Open Working Group consisted of Algeria/Egypt/Morocco/Tunisia; Ghana; Benin; Kenya; United Republic of Tanzania; Congo and Zambia/Zimbabwe (see also Mickler and Wachira in this volume).

For its part, Agenda 2063 is a product of the AU. It emerged from the Golden Jubilee Summit of the AU in May 2013 at which African leaders not only celebrated the historic establishment of the Organisation of African Unity (OAU) in 1963 and its struggles against colonialism and apartheid but also attempted to reignite Pan-Africanism and to foster an 'African Renaissance'. The main outcome of the summit was an eight point 50th Anniversary Solemn Declaration on African identity, self-determination, integration, social and economic development, peace and security, democratic governance, Africa's destiny and Africa's place in the world (AU 2013). The declaration underpinned the framework for Africa's socio-economic transformation that was adopted in January 2015 (AU 2015).

The two agendas, one for the world and the other for Africa, at least compete at the ideological level. The SDGs are a new type of global governance that advance a global vision for a sustainable future of humanity and the planet but they also place 'goal setting at the centre of global governance and policy' (Kanie et al. 2017, p. 1). It has been argued that the SDGs should be seen as 'the latest instalment in an almost 30-year evolution of global governance that began with the popularisation of the sustainable development concept' (Kanie et al. 2017, p. 8). For the AU, the SDGs are a vehicle for achieving its own Agenda 2063, which is underpinned by ideas of Pan-Africanism and African Renaissance.

These ideological differences aside, there is synergy between the UN 2030 Agenda and the AU Agenda 2063. In fact, the AU has favourably compared the goals for Agenda 2063 with all SDGs. For example, the goal for achieving a high standard of living, quality of life and well-being for all citizens in Agenda 2063 chimes with SDG 1, 2, 8 and 11 that respectively aim to end poverty in all its forms everywhere in the world; end hunger, achieve food security and improved nutrition and promote sustainable agriculture; promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; and make cities and human settlements inclusive, safe, resilient and sustainable. Furthermore, Africa's development priorities, grouped into six pillars (structural economic transformation and inclusive growth; science, technology and innovation; people-centred development; environmental sustainability, natural resources management, and disaster risk management; peace and security; and finance and partnerships), are all in alignment with the SDGs, and are supported by the five strategies of the African Development Bank. Thus, the SDGs, Agenda 2063 and the African Development Bank share a common vision of African development. This common vision is being pursued within a political economy whose structure cannot be ignored.

1.3 The Political Economy of Africa's Natural Resources

Much has been written about Africa's natural resources as a curse but less so about how the continent's natural capital remains crucial to the working of the global capitalist economy. An example that comes readily to mind is the key role that coltan from the Democratic Republic of the Congo plays in the global mobile phone industry as well as in the informal economy (Wakenge et al. 2018). A key question that arises in the context of the SDGs is therefore whether the global vision of sustainable development presents a new opportunity for reshaping the political economy of natural resources on the continent. In other words, do the SDGs open up possibilities for forging new political and economic relations that restore Africa's resource sovereignty? It has been argued that such sovereignty is long overdue and that, as a result of this, most African states have been unable to unlock their developmental potential (Acemoglu and Robinson 2012; Centeno et al. 2017). Not all African states are trapped in this situation, as the example of Botswana's impressive developmental trajectory through its governance of natural resources has shown.

It could be argued that Africa's mineral endowment is critical to the SDGs in that extractive industries have impact on the biophysical environment, decent work and human well-being (Khalid and Okwusa, this volume; Moen et al. this volume; Sturman et al. this volume). Conservationists are concerned that there is a high concentration of mineral occurrences in regions of biological endemism, namely Cameroon-Gabon Lowlands, Eastern Democratic Republic of the Congo Lowlands, and the Albertine Rift Mountains (Edwards et al. 2014). They warn that 'without careful management, rapid mining expansion and its associated secondary effects will have severe impacts on African environments and biodiversity' (Edwards et al. 2014, p. 302). In addition to their negative effects on biodiversity, extractive industries have also compromised the quality of water in many parts of the continent, and also globally. These industries are not only associated with intense use of water, but they contribute to long-term water pollution (Schwarzenbach et al. 2010). The same can be said about oil exploration and the hazards of spillage that have clearly been demonstrated by the environmental deterioration in Ogoniland, Nigeria (Osaghae 1995; Porter and Watts 2017).

A major challenge of using Africa's natural resources to attain the SDGs is that there is intense competition over these resources. Investment and trade patterns reveal the rivalry between traditional Western and other emerging interests over Africa's natural resources. Notably, China's investment in Africa is driven by Beijing's foreign policy and is shaped by Western patterns of investment and aid in Africa (Broich et al. this volume). There are concerns that Chinese industries in Africa will not uphold good environmental standards because of China's poor environmental record at home. Intense competition for Africa's natural resources highlights the central role that Africa's natural resources play in world geopolitics. Such competition has significant implications for the achievement of the SDGs in Africa.

Refocusing extractive industries in pursuit of the SDGs requires profound changes in at least three main spheres: governance, human well-being and the environment. Governance structures for natural resources are inherently characterised by unequal power relations and are increasingly being defined by the nexus between the state, private sector and the local elite who share the wealth acquired from the exploitation of natural resources. This has certainly been the case in the fisheries, forests, land, oceans and minerals. The tripartite alliance of the state, private sector and local elites has pushed back fundamental changes required to spur African development. It has, for example, suppressed the possibilities of a thriving small-scale mining

sector and small-scale fishing, though this is not universal across the continent (Crona et al. 2016; Mensah et al. this volume)

1.4 Higher Education Institutions, Networks and African Development

There is a general consensus among scholars, governments and donors that higher education institutions are a strategic resource to be used in pursuit of sustainable development. Their contribution to the SDGs comes in various forms ranging from mainstreaming SDGs into teaching curricula to producing research and data on sustainable development through to producing the requisite skills and the knowledge base crucial for sustainable development (Huckle and Wals 2015; Harris et al. 2017; Aarts et al. this volume). The World Conference of Scientific Academies suggests that university research for sustainable development should sustain and link basic research to social goals; draw together institutions at all levels into a common research system; strengthen collaborative research partnerships between government, the academic and the private sectors; and promote interdisciplinary knowledge and practice (Hassan 2001).

Accordingly, the UN General Assembly adopted a Decade of Education for Sustainable Development (2005–2014) which aimed 'to integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all' [United Nations Educational, Scientific and Cultural Organisation (UNESCO) 2005]. Various studies have reported on the characteristics of university research for sustainable development and on the need to transform the university from its traditional ivory tower and elitist posture to one that is embedded in, and also responsive to, societal challenges, needs, and aspirations in a dynamic world (Waas et al. 2010; Aarts et al. this volume). University research for the SDGs forms part of a set of broader questions about the role of the university in the twenty-first century. This question is more acute in Africa, where the university forms part of a global system of higher education yet it is expected to play a unique and critical role in the continent's development.

The debate on the role of the university in Africa revolves around two main questions, namely how the university regains an African identity and what role it should play on the continent. The question of identity has a temporal dimension as different types of universities have been established on the continent over the years. The first generation of African universities were colonial outposts or appendages of foreign institutions, whose purpose was to produce civil servants (Juma 2005; Mamdani 2018).[2] The new generation of universities on the continent were either carbon copies of older ones or shared a common foundational base with them. Mamdani (2018, p. 29) has argued that 'the modern African university has [little] to do with African institutions'. Hence the need to Africanise them, meaning that they should be guided by, and also communicate the African experience as its key source of knowledge and as a starting point for its scientific inquiry (Ki-Zerbo 1990; Makgoba 2005; Nkoane 2006). With regard to the role of the university on the continent, Juma (2005) has suggested that the African university should be reinvented to serve as a developmental institution. Such a developmental function requires that university policies and regulations should be flexible to enable academic research to contribute to society. The SDGs provide a platform on which the African university could play its developmental role at the local level but also through collaborative research networks in the African continent and in other parts of the world.

African universities are engaged in collaborative research, and a number of its research-intensive universities have in recent years formed the African Research Universities Alliance (ARUA) to foster innovative research collaboration under this umbrella. Such collaborative research extends to universities in other regions

[2]Some of these universities also played the role of creating the African intelligentsia, who contributed to liberation struggles in the continent.

of the world through the Worldwide Universities Network (WUN) and other networks. Collectively, these networks enable African universities to strengthen their position on the continent while at the same time playing their role in the global higher education system. As various chapters in this volume will show, global research networks are not only important for developing the scientific research capabilities of African institutions but also for these institutions to contribute to the production of global knowledge.

1.5 The SDGs: Opportunities and Constraints

Many commentators see the SDGs as providing opportunities at different levels. They mobilise global action towards clearly defined goals and targets within time frames. In Africa, governments often see them as providing opportunities for African development. As former AU Commission Chairperson Nkosazana Dlamini-Zuma noted, 'the post 2015 development agenda is a critical milestone towards the realisation of Agenda 2063, and provides a good opportunity for Africa to complete the unfinished business of the MDGs' (Dlamini-Zuma 2014, p. 4). It has been suggested that the SDGs can serve as a guide to economic and development policy in Africa, as a platform for advancing African agency, and as a pathway for African development (Besada et al. 2017).

Others see the SDGs as an avenue through which Africa's regional strategies could be strengthened. Valensisi and Karingi (2017, p. 50) have argued that translating SDGs into regional development strategies not only enhances the link between global objectives and the multifaceted reality of a multipolar world while also ensuring policy coherence, but more importantly provides 'a strategic option to strengthen Africa's bargaining power vis-à-vis both developed and emerging partners'. In terms of specific sectors, Wesonga and Kulohoma (this volume) review evidence on health information systems to make the case for the prioritisation of effective health systems—including adequate human capital and other resourcing capacities—in achieving SDGs on the continent.

One of the major constraints on SDGs is the global capitalist economy, which also accounts for many of the problems that the 2030 Agenda seeks to address. Many scholars have argued that sustainable development—and by extension the SDGs—is constrained by the plundering of the planet by the capitalist economy (Bond 2002; Angus 2016). The neoliberal turn since the 1970s, green development, and the recent green growth paradigm have ensured that profit and markets remain the priorities of the capitalist system. In other words, the attempts to reconcile environmental protection with economic growth through green growth do not fundamentally shift the tenets of the capitalist economy. Against this backdrop, it could be argued that the SDGs challenge Africa to conceptualise its own economic growth at the time when such growth is said to have reached its limits (Halvorsen and Higgins this volume).

A recurrent theme in the literature is that Africa's diversity—essentially meaning 55 countries with internal variation, at different stages of development, and pursuing their national agendas—can hardly forge a common approach to SDGs (Carin 2014). The assumption that Africa's socio-political fabric is not conducive for the attainment of the SDGs stems from, and is also linked to dominant views about African societies, governance, and development on the continent. Mkandawire (2001, p. 289) captured these views when he commented that, 'one of the remarkable feature of the discourse on the state and development in Africa is the disjuncture between an analytical tradition that insists on the impossibility of developmental states in Africa and a prescriptive literature that presupposes the possibility of their existence'. In other words, African states are expected to do what it is believed they cannot do. Mkandawire (2001, p. 289) calls this contradiction 'the pessimism of the diagnosis and the optimism of the prescription'.

With regard to the SDGs, the prescription is that governance in Africa will have to change if

the 2030 Agenda is to be realised on the continent. Accordingly, it has been suggested that attaining the SDGs in Africa 'will hinge on governance' (Puplampu et al. 2017, p. 5). Reference to Africa's diversity and governance also suggests a default position that a continent such as Europe has a greater chance of achieving SDGs because of the relative economic symmetries among member states and as a result of its supposedly cultural homogeneity. It is said that developed countries face unique transformational challenges such as 'the goals of sustainable consumption and production (SDG 12), sustainable energy (SDG 7) and combating climate change (SDG 13)' (Osborn 2015, p. 2). Mickler and Wachira (this volume) argue that, in the context of the SDGs, African countries have successfully linked governance reform with reform of global governance structures.

1.6 Climate–Human–Ecosystem Interactions

The UN SDG Report of July 2018 noted that 'after a prolonged decline, world hunger appears to be on the rise again. Conflict, drought and disasters linked to climate change are among the key factors causing this reversal in progress' (UN 2018, p. 4). The report highlights the interlinkages between climate and human well-being that has drawn the attention of scholars over a long period of time as evident in climate change and adaptation research (Field 2014; Belay et al. 2017). Understanding these linkages requires attention to palaeoecological data that offer a long-term perspective on climate–human–ecosystem interactions (Githumbi et al. this volume). Such a historical perspective is crucial for broadening our understanding of past and present human adaptation to environmental change and evolving relations between humans and their biophysical environment.

Human-environment relations are forged within the contexts of the politics of nature and the politics of science. That is to say that the enactment of politics associated with the protection of nature is enabled by the scientific study of nature (Ramutsindela, Miescher and Boehi 2016). It is therefore not surprising that much of the climate negotiations reflect these politics even as they depend on scientific data to pursue climate diplomacy. Such diplomacy represents a new kind of politics in climate change negotiations that involve sub-national and non-governmental organisations in the search for global environmental solutions (Hsu et al. 2015). The effectiveness of the SDGs will be measured not only by meeting targets but also by reshaping new human-environment relations. Island states offer some important lessons in this regard. Techera and Appadoo (this volume) have noted that innovative approaches coming from small island nations offer broader lessons for other maritime nations, i.e. effective collaborations between governments and communities. While these collaborations ensure that 'no one is left behind', they should also be understood as a mechanism for empowering local people in development projects. Many critical scholars have been concerned that the joint management of natural resources between governments and local people is often skewed in favour of the state (Kepe 2018).

1.7 Conclusion

The debate about the SDGs is about Africa's development path at the time when green growth is being taunted as a paradigm that simultaneously leads to economic growth and the health of the planet (Puplampu et al. 2017; Halvorsen and Higgins this volume). While the universality of the SDGs means they are applicable to all nations of the world, the specific conditions in Africa demand that greater attention should be paid to the social, political and economic environments in which they are implemented. No country offers the SDGs a blank slate on which to write a global vision. The SDGs should be situated within local, national and regional contexts that are in turn useful for understanding how these

goals meet the real world. We do not call for repackaging the SDGs for Africa. Rather, we suggest that the SDGs should be domesticated to African realities without disrupting existing and promising local development initiatives. African scholars and other researchers should not shy away from a critical reflection on the SDGs even as they acknowledge the prospects of these global goals for African development. Assessments of SDGs in Africa need to consider conditions under which these goals are implemented. We caution that those conditions should not be used to characterise the continent as an exceptional region of the world as there are many similarities between Africa and the broader Global South.

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Part I

Africa's Sustainable Development: Approaches, Institutions, Agendas

Growth or Solidarity? The Discourse of the SDGs

2

Tor Halvorsen and John Higgins

Abstract

The overarching slogan for the Sustainable Development Goals (SDGs) is 'leave no one behind'. To realise this, a transformative shift in our global development is necessary. This means the SDGs cannot be achieved unless large parts of Africa improve the living conditions of the majority of its citizens. This improvement cannot come about through adopting the western 'growth model'; this will only contribute to the destruction of our global environment. The discourse on the SDGs is thus about a development path that secures the livelihood of all those 'left behind' in Africa, at the same time as the Western 'growth model' is transformed. It is a question of how the few within the rich world who are consuming and polluting the most need to act in solidarity with those left behind. In this chapter, we discuss how this ambivalent discourse on growth now plays itself out within the continent and nations most deprived of the fruits of global economic growth. This is also our global challenge. Countries in Africa become the key to successful implementation of the SDGs globally through how they question the consequences of the present growth regime of the OECD world.

Keywords

Growth · Solidarity · Social economy · Development

2.1 Introduction

This chapter risks a general characterisation of what we shall call the discourse of the Sustainable Development Goals (SDGs). It does this in order to identify the effective marginalisation of some of the key dimensions of action, argument and analysis necessary for meeting these goals. 'Discourse' refers principally to both the vocabulary deployed and the dominant form of address adopted in the articulation and representation of these goals, and how these work to focus on some dimensions of the problems raised by the SDGs while marginalising others. Vocabulary and address are important, though often neglected, dimensions of policy articulation (Phoenix 2009; Strydom et al. 2010; Higgins 2013). Our main example here is that of 'growth' as a keyword in the discourse of the SDGs, and our

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approach to this is grounded in the need to recognise how crucial the realities of Africa are to the realisation of the SDGs.

How Africa and African politics seeks to solve the issue of growth will be crucial for how we all succeed in implementing the SDGs, not only in Africa, but also globally. The question asked: why should the continent, which is most victimised by the environmental crises of the industrial OECD-world not itself be allowed to industrialise and thus utilise its own resources for its own people? We argue that this question needs an answer different from that provided by the OECD 'growth model'. This is the dilemma fuelling the discourse on the SDGs and Africa.

2.2 Africa and the SDGs

Reports from Africa often highlight rapid economic growth and a new optimism (Africa Progress Group 2017). Most documents, however, still emphasise the picture of Africa as victimised by its past, and in need of a speedy industrialisation. As things stand, a central factor for Africa is growth in population, and within this population, an ever larger cohort of young people without work, with all the threats of major social, political and economic instability that this cohort represents. In addition, such growth threatens to result in uncontrolled urbanisation and pressure on already scarce fresh and clean water, conflicts over this and other basic resources (including especially food), deepening inequality within cities, and growing population displacement as people try to escape from an abject and desperate position.

Exacerbating this desperate situation, we are likely to see the emergence of a new phase of global imperialism, where resources are exchanged between elites to advance their own enrichment. Here, the protection of global capital by international agreements and lack of capacity in public administration to enforce many environmental restrictions and laws leads to environmental degradation and exploitation; the use of coal and oil will escalate, despite a more modest growth in the use of alternative energy sources for the less fortunate. Energy consumption which will continue to grow, use made of green resources will lag behind. In general economic terms, African countries may well continue to enjoy a comparatively high rate of growth, but with deepening inequality and the reign of poverty, not to mention growth in CO_2 emissions. Africa will thus also contribute to the downfall of this earth, but of course still far less than the OECD countries today.

The growing environmental crises, to which Africa contributes only in minor ways compared to the rich West, will gradually hit Africa the hardest, causing even more conflict over basic resources such as water, land and access to stable food supply. The uncontrolled urban settlements will become breeding grounds for diseases like cholera due to lack of infrastructure, (renewable) energy solutions and housing that can take extreme rainfalls, heat and drought.

2.3 SDGs as a New Course for Africa and for the Globe?

The interventions embodied in the SDGs and the social, political and economic transformations implicit in these opened up the discourse about 'growth': Green growth, inclusive growth, circular growth, even de-growth. During the negotiations leading up to the agreement of the SDGs, the African representatives played a crucial role at all levels, and as a collective voice through Group of 77 (G77), as the so-called 'developing world' defending its rights to grow as the West has done (Dodds et al. 2017). If no one is to be left behind, what kind of growth must Africa have? Building on the African Agenda 2063, which called for Pan-African agency and unity, a guide for influence on the SDGs developed in parallel, and was agreed on by end of 2014

This chapter focuses on 'green growth', which is to be driven by an economy that activates new entrepreneurs, promotes local innovative capabilities and is supported by renewable energy. Social ills will also be cured as the economy improves. Gradually, inequality will be reduced, not primarily by transfer and redistribution, but

by participation in working life, or in economic activities generally. Poverty is reduced: children gain energy and time away from work to attend school; women are acknowledged for all their work, including the 'invisible' and unpaid labour in households, and as domestic workers.. Water is supplied to everyone, as are other basic services, and all resources are used in an environmentally friendly way.

Agenda 2030, however, more than Agenda 2063, problematises how the social, the environmental and the economic development go together; acknowledging usually ignored fissures in the discourse of growth. This debate ahead of the agreement of the SDGs showed a global engagement from numerous experts, NGOs and representatives of international organisations. The SDGs as a global initiative, thus asks how can green growth be possible without a more dramatic change of the growth models of the OECD world; a change far more radical than just greening and 'including' as in green and inclusive growth? Africa's development model, as planned so far, becomes within this discourse 'a global challenge' where the African answer (Agenda 2063) is the most authoritative answer. This answer can however be criticised for not taking the challenge of growth serious enough, neither in Africa, nor in the parts of the world where economic growth no longer has any meaning.

The scale of change and transformation implied by the SDGs is necessarily global in nature and attends to the interconnectedness of peoples, economies, resources and crises in the one physical world that we all share. Successful transformation is a global issue as well as always a local one. The slogan 'act local think global' undervalues the fact that our ability to act locally today depends on an alternative global mobilisation. There needs to be a de-concentration and a democratisation of political power beyond the nation-states, legitimising changes in, for example (and perhaps most important), the ownership of resources, a check on irresponsible consumption and an immediate general reduction in energy use (zero carbon). What this means in practice is that the wealthiest parts of the global collective need to find ways to live that are sustainable, and also allow for the transfer of resources to improve the basic living standards of the global poor. After all, the SDGs demand a 'transformative shift' and an effort to 'leave no-one behind' as expressed in goal 17. How the African countries, many of which are the ones left behind, choose to develop their economies, is the key to the realisation of the SDGs also as a global commitment. For this purpose, knowledge can and must also play a role in shaping this discourse on alternative development paths.

2.4 The Growth Paradigm

SDG policy discourse—its key terms and forms of address—bears the marks of this struggle over categories and expropriation of knowledge types. This crucial discourse about our future we will approach in the first instance, we will approach this crucial discourse about our future through a brief analysis of the central but occluded term 'growth'. Growth remains a keyword in ongoing SDG discourse, even or especially as it comes through in a compromise form as somehow synonymous with sustainable development itself (Dodds et al. 2017). This compromise must be understood against the background of our history where alternatives to the kind of growth we know today have been systematically repressed, including within the academic world, or particularly among academics (Bonneuil and Fressoz 2016).

At the very least, since the publication in 1972 of the Club of Rome's influential report, *The Limits to Growth,* the idea of growth as the unchallengeable goal and measure of global development has been contested; but never quite defeated. Indeed, as Schmelzer (2016) has recently demonstrated, influential institutions such as the Organization for Economic Co-operation and Development (OECD) (also a partner to the Club of Rome network) have been largely responsible for maintaining a positive idea of growth, despite the criticisms. OECD is today 'a leader' in the debate about 'inclusive growth, green budgeting', etc. (OECD 2018).

Like all keywords, the single word 'growth' had many meanings in the western world. It took

a great deal of politicking and think-tank coordination by OECD to come up with an 'authoritative' definition; one which made it materially possible to transform how states both gathered data, set up their economic planning instruments, recorded economic movements, excluded and included types of activities [for example excluded work in homes or generally unpaid household (women's) labour]. Nothing better illustrates the material force of vocabulary than these struggles around the idea of growth, and, as Schmelzer summarises in *The Hegemony of Growth* in the general context of the Cold War, colonial decline and new dynamics of international competition, 'economic growth became the most essential symbol and key foundation of national power' (Schmelzer 2016, p. 347). 'It was not', he emphatically insists,

> in the terms of equality, emancipation, or empowerment that nation states around the world came to compete against each other, but in terms of rising quantities of goods and services produced. Growth became the internationally accepted policy goal, common denominator, and most basic form of global governance.

For the first time, 'the Economy' appeared as a separate animal, a fixation of its own beyond society and politics, an essentially defined creature with a big E. Growth became both a means and an end for nation-states, expressed as Gross Domestic Product (GDP). Once the statisticians and the economist working on this during the decade or so after WWII, and got this one measure right around 1960, there was no turning back. Today, failed economic growth—indicated by a falling GDP—is scarier to most governments than the fact that this earth cannot house us much longer.

It is no surprise, then, that his idea of growth as the internationally accepted policy goal and common denominator played itself out in SDG discourse as one of the most difficult issues to deal with. Given the Goals 1 and 10 on poverty and growing inequality, and all the other Goals about life on land, in the ocean, it may be a contradictory demand (from G77) to ask for more industrialisation and rapid growth to solve future social problems.

The main impression is however that the SDGs discourse has again as in 1972, made it legitimate to talk about 'limits to growth' as a common global issue. The compromise reached reopened this discourse instead of keeping it closed, as it has been for so long due to the neoliberal hegemony and the particular discursive perspectives provided by the economic profession. If we want a change in line with the basic values promoted by Agenda 2030, this is where the debate has to continue and as we argue, it has to focus on Africa. The countries, both in the South and the North, realised, as they debated Agenda 2030, that the growing inequality of this world needed to be addressed, since this was a symptom of the failure of the present global growth regime.

2.4.1 Grappling with the Social and the Environment—Only Growth Can Help?

A long and thorough process led up to the *Africa Regional Report on the Sustainable Development Goals,* during which it was argued that 'the environment is considered the source of life, and gives rise to economic activities, which in turn sustain social development' [United Nations Economic Commission for Africa (UNECA) 2015, p. 2]. The discussion thereafter is about how to make a fast-growing economy more socially supportive (inclusive growth in today's language). Judged from this important report, Africa places itself in the camp of those who say economic growth is a precondition for solving social issues. The East Africa region, for example, describes its 'wants' in the following terms:

> High and sustained economic growth to translate into jobs and human development; improvement in education and skill development; increased agricultural productivity and value addition; sustainable energy development; improvements in access to affordable health care, tackling environmental and climate related challenges; and infrastructural development (UNECA p. 3)

Here, we can observe the language and syntax of the growth discourse in operation. With the

foregrounding of growth as the most active agent, the all too easy assumption follows that this translates not only into jobs but also human development itself. The text relegates what otherwise might seem more central (education and skills development; access to healthcare, etc.) to the status of literally (syntactically) secondary needs.

But nuances can be detected also here, as in the global discourse on 'growth'. The Southern African region gives priority for action and attention to the social, foregrounding the 'fight against poverty and inequality', and calling for 'improvements in health and nutrition; improvements in education; promotion of gender equality and women's empowerment; sustainable environmental management and climate change' (UNECA p. 14). The authoritative conclusion offers an important qualification to the syntax of the growth template, insisting: 'Growth should translate into improvements in human development. Africa´s drive for structural transformation should have sustainability at its core and ensure the creation of decent jobs and poverty eradication' (UNECA p. 14). We see how the green and inclusive growth discourse emerges; but also how the imperative force of 'should translate' registers the fact that this translation is far from automatic, and in reality requires an active translator to force purely economic growth into the channels of improvements in human development.

We can also find a more nuanced discussion on this in the comprehensive *Draft Africa Report on the Sustainable Development Goals* of 2013 (UNECA 2013). This report shows that the huge cost of transforming from the growth paradigm (that after all leaves many behind) into a process that is in line with the SDG slogan—'leave no one behind'—cannot in itself be dealt with within the growth paradigm, as social and environmental costs are seemingly excluded.

The overall impression then is that despite the tendency to make economic growth a 'precondition' for the SDGs, we also see a change in rhetoric away from the neoliberal type of state/economy relation promoted by the World Bank, IMF, WTO and others towards what has long only been an ideal; the so-called 'inclusive growth'. Even the Kofi Annan-led Africa Progress Panel in its report *Global goals, African realities: Building a Sustainable future for all* is moderately critical of what he, in his period as Secretary-General of the UN, seemed to embrace: the 'trickle down' ideology of 'growth first'. He is now making the crucial statement (about a reality known among working people, unemployed women and poor children for centuries) that 'High growth has not always reduced poverty' (Annan 2016, p. 74). This common sense knowledge is now confirmed by recent research:

> New research undertaken for the Africa Progress Report has explored the interaction between average income and the incidence of poverty in four countries. Both Ghana and Tanzania reduced poverty, though by less than the amount predicted on the basis of their growth performance (…) While Zambia registered strong growth, poverty levels increased by half-a-million people. Nigeria also saw an increase in poverty (Annan 2016, p. 74).

Thus, from a most influential forum on African development, a critique of the success of the hitherto overall dominating growth paradigm has been legitimised, though the paradigm itself not confronted head-on. As within the SDGs, the debate is on. The report does not discuss or evidence when growth does lead to reduction in poverty. Mostly, we see this happen when labour unions are strong, and part of a broader 'wage–dependent' class mobilisation (Rueschemeyer et al. 1992). This insight is also important for how we expect academic knowledge to be relevant for the SDGs and social mobilisation for their implementation as an alternative to the growth model.

2.5 The Eco-social Lens and the Social Solidarity Economy

As Scoones and his colleagues demonstrate, the many references to 'green' (of power, industry, markets, energy) only serve to blur the compromise around the issue of growth (Scoones et al. 2015).

Our role as academics is to clarify and contribute to ongoing discussion with a knowledge-driven alternative to the blurred debate about varieties of the growth paradigm. Support of such an effort has been voiced from the highest quarters of the science community. In 2015, the International Council of Science and the International Social Science Council suggested the need to identify the 'ultimate end' of the SDGs as something like 'a prosperous, high quality of life that is equally shared and sustainable', and argued that such an overarching goal should be reflected in new metrics for measuring progress towards it. In particular, they argue the need for a move beyond using GDP as a proxy for the overarching goal, and noting that 'GDP was never designed for the purpose of measuring development, much less sustainable development. (…) SDG framework should promote a new approach to measuring economic progress towards sustainable development' [United Nations Educational, Scientific and Cultural Organization (UNESCO) 2015, p. 9].

Similarly, in 2016, the UN Research Institute on Social Development (UNRISD) pressed the sore point harder still, insisting that

> (…) based on carbon-fuelled growth, the global economy in its current form is incompatible with environmental sustainability. (…) Combating climate change and environmental destruction caused by unsustainable patterns of consumption and production will require multiple innovations at the conceptual, policy, institutional, social and technological levels. The sustainable development model, which integrates economic, environmental and social objectives, needs to fully replace current growth-led models where the social and ecological dimensions are mere add-ons (UNRISD 2016, p. 152).

In place of accommodation to the continued dominance of the growth paradigm is the recognition of a need for a tighter understanding of the cultural and political dimensions of these necessary changes. Transforming our world toward sustainability requires understanding of environmental degradation and climate change as social and political issues, they argue, emphasising that,

> Adopting an eco-social lens in policy design and implementation can facilitate not only green but also fair approaches that will be required to achieve the SDGs. It would help minimise the risk of injustice associated with green economy policies, and redress the distributional impacts of environmental and climate change policies in favour of vulnerable groups (UNRISD 2016, p. 224).

Truly sustainable development, the report argues throughout, requires changes in production and consumption patterns that challenge Northern industrialised countries but also guide the so-called catching-up processes in the Global South. Given the situation we are in, it can no longer be a question of 'catching up', but rather of sharing the burden of the transformative shift necessary for the world's survival. In other words, we can no longer be led by the hegemony of the Northern growth paradigm and the distorting imperatives built into its vocabulary.

The reports discussed above touch on, in their different ways, the core challenge implicit in, but often avoided by, much SDG discourse: the political challenge. Here, the key question—the 'practical question', as one commentator notes—is 'whether (and how far) collective political intelligence can hope to establish control over the blind, convulsive, irresponsible dynamics of competitive economic effort' (Dunn 2002, p. 126). In this search for collective intelligence and control, Dunn (2014) highlights the crucial contributory role that higher education may play. While fully acknowledging this role, the final section of our argument seeks to point out some of the ways in which the discourse of the growth paradigm has infiltrated and impacted on the higher education system in ways that threaten to undermine its contribution to the SDGs.

2.6 Higher Education and the Growth Paradigm

Not only is education the target for Goal 4 (cf. Karani and Preece this volume), which seeks to ensure inclusive and quality education for all and promote lifelong learning, but it is also generally understood as a necessary moving force in the realisation of SDGs and as a key agent for

change (UN 1992, 2002). It is important to recognise that the need to improve the capacity of the people to address environmental and developmental issues has, in practice, two distinct dimensions.

The first of these refers to the scientific and the technological: the capacity for education to generate the innovative forms of specialised knowledge, scientific discovery and practical innovation that will generate the means to address the core scientific challenges presented by the SDGs. Here, education and particularly higher education can, in conjunction with public enterprises, generate new products and knowledges to meet and perhaps overcome these challenges in the name and under the banner of innovation (see Pinker 2018).

The second dimension embodies the public knowledge mission of higher education: its capacity to help form the ground of both knowledge and opinion necessary to sway individual behaviour, government policy and corporate attitude to meet the social and political challenges of a catastrophic world. In this public knowledge mission, the role of universities and the academic profession is to enlighten, to contribute to a normative shift, develop the social solidarity economy, promote the eco-social paradigm, and support democracy as a system for political mobilisation from below and as a source of transition and structural change.

At this point, we need to observe that the same ideologies that worked to retain and assert the centrality of the growth paradigm have also been working to exert influence and control over higher education systems in ways that undermine many different aspects of the public knowledge imperative. Central to understanding this threat is the recognition of an important though often neglected shift in what we might call the ecology of the disciplines: the place and status of economics within what Kant famously labelled the 'conflict of the faculties'.

In an intriguing and highly suggestive analysis, Schmelzer (2016) has evidenced the ways in which the adoption of the growth paradigm has meant that the practical dominance of the legal profession in state policy advice slowly gave way, in and through the 1950s, to the sway of economics. As he notes, the 'increased responsibility of government to boost growth not only advanced the authority of economic experts in traditionally noneconomic, social, and cultural realms, such as science and education policies, but also fundamentally intensified what has been discussed as the scientization or economization of the social' (Schmelzer 2016, p. 352).

As a number of commentators from across the world have observed, this new directive centrality given to economics—and a particular form of economics at that—has been having important and rapidly expanding consequences on the nature of the higher education system itself as it too becomes subject to the logic and vocabulary of the growth imperative (Halvorsen 2017; Halvorsen and Ibsen 2017). Central to this is what Neave (2004, p. 143) observed in the United Kingdom to be the 'fundamental reframing of higher education from being a sub-set of the political system…[to] a sub-set of the economic system'. In the context of the United States, Gumport (2000, p. 70) identified this as a shift from the 'dominant legitimating idea of public higher education…as a social institution…toward the idea of higher education as an industry'. In this reframing, we see a consistent move away from the idea of the university as a public good, whose core value is that of academic freedom to a practice of higher education devoted to *human capital* development in the interests of the economy (Brown 2015).

As a public good, the university is understood as the necessarily disinterested space for the preservation, transmission, extension and critique of human knowledge and expression in all forms, and with the idea of academic freedom as a central and organising value. When universities are called upon to justify themselves in relation to imperatives and vocabulary of economic growth, this is perceived to be incommensurate with the real substance of the academic mission (Collini 2012; Higgins 2013, 2016). When we need to guide the discourse away from growth as we know it, it is detrimental. Improving the capacity of people to address environmental and developmental issues is likely to need

universities devoted to the formation of an engaged and educated citizenry through the practice of academic freedom, rather than a higher education system geared exclusively to the demands of an economy predicated on the siren song of competitive growth.

2.7 Concluding Remarks

If we want our academic knowledge to contribute to the 'normative shift' towards a social and solidarity economy that the SDGs require, we need to change the ways in which academic knowledge is valued. This means a very different kind of knowledge/policy linkage than that provided by the vocabulary of the 'growth' paradigm. Academic freedom and public funding of research become (once again) critical for our future (Leach 2016).

The laboratory for this transformation is in many ways Africa. It is a continent most victimised by mainstream economics and global capitalism. At the same time, Africa can justify its demand for social and material development with reference to the SDGs. The demand from us all across the world is that we must not yet again suffer from the destructive consequences of industrialisation. The discourse on the SDGs—to which the academic community must contribute—invites debate about a new development path for the countries that are not only most threatened, but which also house potential solutions to the global challenges.

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Lifelong Learning and the SDGs

3

Florida A. Karani and Julia Preece

Abstract

In this chapter, it is posited that lifelong learning is a pivotal, people-centred educational strategy that should be tapped for meeting several targets for the Sustainable Development Goals (SDGs). Lifelong learning should, therefore, be given more space in the SDGs. The chapter outlines some of the tensions that surround the concept, goals, and purpose of lifelong learning. It offers an explanation of the arguments that ultimately led to the recognition of the need to include lifelong learning in the SDGs, but argues that lifelong learning is still inadequately reflected within and across the 17 goals. The rest of the chapter introduces the three main modes of lifelong learning: formal, non-formal, and informal. It is argued that these latter two modes are the least recognised in the SDGs, particularly in relation to poverty, health, and the environment, even though they are the most likely to contribute to the needs of the underserved and underprovided social groups. This chapter, therefore, focuses on these two modes with a view to exploring how they could be operationalised to contribute to the achievement of all the SDGs in the African context.

Keywords

Lifelong learning · Non-formal learning · Informal learning · Quality education

3.1 Introduction

While the argument for lifelong learning has a long history (see for example Lindeman 1926; Yeaxlee 1929) it is premised in contemporary society on the understanding that we live in a world of increasing complexity in which people need to constantly update their knowledge, skills and understanding of how to respond to rapidly changing circumstances. However, lifelong learning has traditionally suffered from conceptual ambiguity with a multitude of perspectives: 'It is both individual and institutional; it appears to be both a social movement and a commodity; it carries value connotations that are sometimes misleading… it is both a policy and a practice' (Jarvis 2009, p. 9).

Although a broad understanding of lifelong learning is that it encompasses all learning that takes place from the cradle to the grave, in reality, policy documents have reduced its purpose and focus to narrowly defined activities

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such as literacy or post-literacy in many African contexts, or more generally vocational skills training for the labour market with a focus on youth and adults (Preece 2015). There has thus always been tension as to whether lifelong learning should serve a humanitarian or economistic purpose. In spite of the dominant economistic policy focus through organisations such as the World Bank or Organisation for Economic Community Development (OECD), United Nations Educational, Scientific and Cultural Organization (UNESCO) has consistently supported a broader humanitarian vision for lifelong learning, particularly in relation to the role that adult education can play in enhancing the lives of marginalised social groups. This holistic vision was widely embraced in the twentieth century as a result of the DeLors' Report in 1996 (DeLors et al. 1996) which highlighted four pillars for lifelong learning as learning to do, to know, to be and to live together. Although these pillars have often been added to in recognition of current environmental or social concerns (for example, Torres 2003; Jarvis 2007), they are still a discursive resource in African literature as well as further afield (Preece 2015).

UNESCO (2015a) also submitted an 85-page document titled *Rethinking Education: Towards a Global Common Good* in anticipation of the SDGs. In this document, the purpose of lifelong learning is given a strong social purpose to sustain and accelerate improvement and development at the personal and socio-economic-cultural-political-environmental levels. At the 2015 World Education Forum, lifelong learning was identified as: 'about meeting the diverse and context-specific learning needs of all age groups, including the acquisition of basic literacy and technical skills through both formal education and effective alternative pathways to learning' (UNESCO 2015b). These alternative pathways to learning can be understood as embracing informal and non-formal learning modes.

Adult learning is commonly understood to reflect learning that takes place as a post-secondary school activity. However, in African contexts and similar developing economies, this may well mean the first opportunity to learn for some adults (Preece 2009). To this end, the UNESCO Institute for Lifelong Learning (UIL) produces regular reports on the progress of adult learning policies and activities around the world, such as the third Global Report on Adult Learning (UNESCO UIL 2016) and organises a global conference every 12 years to stimulate interest in achieving adult and lifelong learning for all.

However, UNESCO and others had long argued during the internationally agreed Millennium Development Goals (MDG) period—between 2000 and 2015—that although adult and lifelong learning were essential ingredients for achieving the MDGs they were significantly absent from any policy discussions and therefore suffered a funding deficit. Within the context of the SDGs, unlike for the MDGs, Africa forged a Common African Position (CAP) based on the following six pillars:

- Structural economic transformation and inclusive growth
- Science, technology and innovation
- People-centred development
- Environmental sustainability, natural resources management and disaster risk management
- Peace, security
- Finance and partnership.

The strategy identified as the driving force is 'structural transformation for inclusive and people-centred development' (African Union 2015, p. 2).

The movement towards the SDGs, particularly since the UNESCO World Conference on Education for Sustainable Development in 2009 has, with the aid of international non-governmental organisations such as the International Council of Adult Education (ICAE), created a momentum for reasserting the role of adult and lifelong learning. The UNESCO 2009 World Conference issued a call for action to address unsustainable lifestyles and development activities for 'social justice, food security, ecological integrity, sustainable livelihoods, respect for all life forms and strong values that foster social cohesion, democracy and collective action' (UNESCO 2009,

webpage). It will be seen that these issues are now represented across the SDGs. UNESCO's declaration stressed the role of 'formal, non-formal and informal education… in a lifelong learning process' in achieving these aims (UNESCO 2009). Further arguments in the adult and lifelong learning literature from UNESCO followed. For instance, its *Global Review of Adult learning and Education* (GRALE) report of 2013 (UNESCO UIL 2013) highlighted the role of adult education, from literacy as a foundation for lifelong learning upwards, in contributing to sustainable development. Similarly, the Education for All (EFA) *Global Monitoring Report* (UNESCO 2014) made an assessment of education's role in combating the negative impacts of environmental degradation and climate change.

The issue of social justice, therefore, became a theme for informing future policy for education and sustainable development in a framework of lifelong learning. The achievement of a specific reference to lifelong learning in SDG 4 for quality education was therefore welcomed. It is now stated thus (United Nations 2015): 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. UNESCO's position on SDG 4 is that 'Education for sustainable development (is) a key instrument to achieve the SDGs' (UNESCO 2017, p. 7). Lifelong learning is an educational catalyst which cuts across the 17 SDGs, it has a wide role to play, and its function is cross-sectoral. Notwithstanding this role, it is evident that lifelong learning is not visible enough in SDG 4. It is also not visible in the rest of the SDGs. This is the perspective conveyed to the nations regarding their obligation to implement the SDGs—a perspective that is minus lifelong learning, and therefore lacking as a driving force for reaching the targets.

Although lifelong learning is not mentioned again in Goal 4 or any of the remaining 16 SDGs, and adult learning, a core component of lifelong learning, is only mentioned in relation to literacy, gender equality and vocational skills, one of the targets (target 4.7) addresses a broad, inclusive agenda that touches on issues that are covered in the remaining 16 goals:

> By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (UN 2015a).

This target provides a discursive space to assess the potential contribution of lifelong learning to the SDGs, through a variety of media.

The Education 2030 Incheon Declaration and Framework for Action (UNESCO 2015d) provides guidance for the implementation of the SDGs. It advances the approach of including education for sustainable development in national education systems by incorporating SDG content such as gender, equity, human rights, global citizenship education, through mainstreaming them in policies, curricula, teacher education and examinations. The whole institutional approach and action-oriented transformative pedagogies are supposed to be the driving force in delivering this education. This approach has value in that the learners will have a broad perspective about the SDGs and may recognise them in their various life situations, but, it is argued in this chapter that formal education alone will not fulfill the function of lifelong learning which has direct impact on the problems identified in some of the SDGs, such as poverty, hunger, health, gender and the environment.

While 'education' can be understood as the taught provision made available to individuals and groups, 'learning' is understood to be the individual and social process of acquiring skills, attitudes, knowledge and understanding through different educational modes which ultimately results in personal transformation (Jarvis 2012). Education, however, is not value-neutral. If it is to address the challenges outlined in the SDGs it requires a humanitarian approach, with understanding and respect for diversity as well as an understanding of the needs of future generations (Walker and Loots 2016).

Informal education, non-formal education and adult education as a core component of these modes are context-specific strategies to enable

learning and which aim to achieve behavioural change and transformation. The CAP's people-centred development priority underpins this approach. In the subsequent discussion, it is shown that these context-specific lifelong learning strategies can have direct corrective and remedial impact on some of the problems addressed in the SDGs. Thus, their operational presence across the SDGs is necessary if the stipulated targets and results are to be realised. Providing space for lifelong learning across the SDGs, therefore, should enhance their potency. We now explain in more detail the nature of the different forms of educational provision within the framework of lifelong learning for all—but with a particular focus on non-formal and informal learning provision which largely addresses the needs of adults or out of school youth.

Formal education generally refers to the schooling sector which is age-related, certificated and follows a standardised curriculum in progressive levels of difficulty (Thakaso 2017). It is this sector which has been the priority of the international development goals for education since the year 2000. It has been pointed out, however, that *not all* formal education results in learning because of the poor quality of teaching and resources. In some cases, schooling is affected by conflicts and disasters that reflect the other SDGs (poverty, hunger, sanitation, health, impacts of climate change such as drought and flooding, and so on). Furthermore, the challenges associated with school attendance have often resulted in high levels of school dropout (Zeelen et al. 2010; UNESCO 2017). The contrast between figures in Sub-Saharan Africa and more advanced industrialised nations are stark in this respect. For instance, UNESCO (2015c) reported that nearly 30 million children of primary school age were still not in school in Sub-Saharan Africa, whereas in the industrialised nations enrolment even at secondary level was close to 90%. These figures highlight the need in Sub-Saharan Africa for alternative modes of provision and also for provision that is accessed at all stages of life and in all settings. The most commonly recognised alternative form of provision falls under the nomenclature of non-formal education. We now turn to this concept and what it might mean in relation to learning and achieving the SDGs.

3.2 Non-formal Education/Learning and the Sustainable Development Goals

Although MDG 2 aimed for universal primary education for all and a 50% reduction in illiteracy rates, it is evident that these targets were not met. Where primary education increased, the quality of its education was often a matter of concern (Tikly and Barrett 2013). The inadequacy of many universal primary education initiatives to address the needs of many families has necessitated alternative initiatives that aim to be more flexible and relevant for their participants (UNESCO 2006). There are, for instance, nomadic groups such as the pastoralists in Kenya whose lifestyles require flexible provision that caters for their pastoral activities and seasonal movements (Karani 2002). The ongoing educational inequalities that persist into adulthood, and the rapid advances in understandings concerning health, disease and environmental challenges also necessitate that such alternative learning opportunities have to be accessible to all ages and in all settings, not just out of school children and youth.

Non-formal education (NFE) therefore occurs in most countries across the globe. It is now a recognised source of lifelong learning. While definitions have been provided since the 1960s (Rogers 2004), the UNESCO 2006 definition provides a comprehensive explanation that attempts to distinguish it from formal or informal education as follows:

> … it is learning embedded in planned, organized and sustained education activities that are outside formal education institution (sic), responding to education needs for all persons of all ages. The purpose of NFE is to provide alternative learning opportunities for those who do not have access for formal schooling or need specific life skills and knowledge to overcome different obstacles. Non-formal learning is also intentional from the

learner's point of view, as opposed to incidental or random types of learning (UNESCO 2006, p. 39).

As with the definitional ambiguities of lifelong learning, NFE can be both a process and an outcome. It is often characterised by what formal education is not. So words like participatory, flexible, part-time, learner-led are often associated with NFE, though these approaches are also associated with more progressive formal provision (Preece 2011). The underlying purpose of NFE has been critiqued in terms of whether it serves merely as a deficit, compensatory model for learning or whether it creates new learning opportunities that address everyday challenges in a more realistic and relevant way (Rogers 2004; UNESCO 2006). It could be argued, for instance, that the complexity of today's SDGs requires learning opportunities that are more responsive and focused on specific issues as they arise, rather than concentrating on a prescribed curriculum. Another aspect for consideration is whether NFE learning is more likely to address collective, community concerns since it often takes place in community settings. Nevertheless, the overriding perception of NFE is that it creates opportunities for more flexible learning spaces and times and enables a more learner-centred and responsive curriculum that has immediate relevance (Preece 2011). If we look at the targets of some of the SDGs in this light, we can see that NFE can be a primary source of learning to address these targets. SDG 1, for instance, includes the following targets for eradicating poverty (UN 2015b):

- By 2030, ensure that all men and women, in particular, the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
- By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.

While substantial infrastructure resources and government resources are required to enable access to microfinance or other social support systems, these targets focus on the needs of adults. Adults, who are literate, have learned to understand land and property rights, and the use of information technology, are better able to defend themselves against corruption and exploitation of their scarce resources. Similarly resilience can be enhanced if people are provided with relevant information about climate change signs and taught how to adapt their livelihood strategies through updated methods of farming or producing other sources of income. Such activities need to be taught 'in situ' in a context where immediate results can be seen as motivation to continue learning.

Similarly, the associated SDG 2 of reducing hunger highlights targets that require enhanced agricultural knowledge and understanding of climate changes for increased production. For instance (UN 2015c):

- By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Adults who receive collective training on new agricultural methods, and how to adapt indigenous farming practices to changing climatic conditions can then work together to produce higher yields and support one another in the use of resources. Non-formal provision is likely to take place at an agreed time and venue between learner and provider. The required learning content can be negotiated to be relevant to the learners' own identified needs and the learning outcomes are therefore more likely to be specific to the participants' immediate context and situation. Since the outcomes of climate change and crop production challenges are often localised, this form of learning is the most appropriate for addressing SDG 2.

Finally, since health education is a primary concern for enhancing well-being (SDG 3) and increased productivity, the following targets are identified as potential foci for NFE (UN 2015d):

- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.
- By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Such targets require individual and community education concerning the self-management of care and prevention strategies. Premature mortality requires practical health provision but it also requires increased understanding among adults and their communities of how to take care of their bodies and families. Moreover, a better understanding—as identified through information and education—of family planning and reproductive health measures will impact on overall family health. And, of course, if people learn through non-formal programmes at work about the care and treatment of hazardous materials, they will be better equipped to implement safe practices. But such learning will not necessarily take place without appropriate learning environments where people can interact and discuss the implications of healthy living requirements within particular social or cultural contexts, as is evidenced in a number of recent studies on community learning about health (Mosuoe 2016) and farming (Kaziboni 2017).

3.3 Informal Learning and Sustainable Development Goal 4

In the foregoing review it is evident that addressing deprivation problems identified in the SDGs requires learning processes that change and improve people's conditions of life directly, especially among the underserved and underprovided groups. It is shown in this section that informal learning is one such learning process that can change and improve lives.

Informal learning has been described as tacit or intentional learning in which people engage individually or collectively without direct reliance on a teacher or structured curriculum (Livingstone 2001). In essence informal learning is experienced in everyday life through interacting individually or with others in different situations and environments to explore and enlarge experiences. It is therefore extensive, diverse and unstructured. Its presentation ranges from incidental, random conversational media and net types and contexts to purposeful informal learning as happens in the informal sector discussed below. In a study on *Informal Learning and Conceptual Distinctions: Preliminary Findings*, Livingstone (2006) found that an average adult spends ten hours a week on informal learning practice. Jeffs and Smith (2011) reported that most people's learning is informal, occurring in work settings, community and family. This cursory overview demonstrates that informal learning is crucial to individuals and society for continuous and holistic growth. Needless to say, informal learning/education was the way of learning in traditional African education systems where male and female children learnt through observing, hands-on and by participating in community tasks and events (Omolewa 2009). In this way, they not only mastered their traditional adult roles but were also incorporated in their

respective communities. But the standing of informal learning in traditional education was different—it was the nerve centre through which valued societal roles were passed on to future generations. Informal learning in today's informal sector is for survival.

This section focuses on purposeful/intentional informal learning—the *modus operandi* of learning in the informal sector. It is shown that this mode of learning has proved to be an effective intervener against poverty. The first listed 2030 SDG, 'no poverty', is a carry-over from the 2000–2015 MDGs where 'poverty' along with hunger is listed as problem number one and a leading problem in Africa. Poverty manifests itself in various states of deprivation—lack of resources to satisfy basic needs such as shelter, food, clothing, lack of access to education, safe water and appropriate sanitation, gender inequality, and disease. These problems are captured in the following SDG targets:

2. Zero hunger.
3. Good health and well-being.
5. Gender inequality.
6. Clean water and sanitation.
10. Reduced inequalities.

The informal sector is where most underserved and underprovided groups such as slum dwellers, the unemployed and the poor seek the means to survive as a last resort by engaging in unregulated informal modes of petty trading businesses to generate income and earn a living. In Kenya, for example, the informal sector employed 11.8 million people in 2014 against 2.4 million employed in the formal sector. That is, out of 799,700 jobs created, 693,400 were in the informal sector (Kenya National Bureau of Statistics 2015) The skills, knowledge and know-how acquired for performing the trades are self-taught or picked up informally through observation, imitation, hands-on and trial and error (Karani forthcoming). A large proportion of the population in Africa has escaped extreme poverty through these means, even though the income is generally small.

This leads to the observation that lifelong learning which encompasses informal education along with the other educational professional modes highlighted above requires space of its own in order to attract direct and relevant measures to empower it to deliver. Policies that merely associate lifelong learning with mainstream education inevitably marginalise large sectors of the population who cannot or do not access formal education provision. For example, UNESCO (2016, p. 11) identifies the key feature of lifelong learning as 'a broad scope ensuring lifelong learning opportunities for all' and in this context states that:

> SDG4-Education 2030 aims to ensure equitable opportunities to education in a holistic and lifelong learning perspective. It aims to ensure universal pre-primary, primary and secondary education leading to effective and relevant learning outcomes for all children, youth and adults as a foundation for lifelong and life wide-learning. In addition, SDG 4 also aims to ensure equal opportunity in access to further learning opportunities for youth and adults throughout life.

Informal learning in the informal sector is often desperate and self-initiated, which has grown out of necessity as last resort to eke out a living. This learning may not have built on any foundation and can barely be described as access to further learning without more authoritative recognition and support. Perhaps persistence of poverty and related states of deprivation have been due to failure to give lifelong learning due to recognition across the different educational modes—informal education, non-formal education and adult education.

3.4 Conclusion

In this chapter, contributions of lifelong learning to the achievement of Sustainable Development Goals in Africa were discussed. It has been argued that lifelong learning has an important humanitarian contribution to make in enabling people to make sense of an increasingly complex world. While the main modes for lifelong learning are formal, non-formal and informal, it is the latter two modes that contribute to the needs of the underserved and underprovided groups who experience the problems addressed in several of the SDGs. It is, therefore, these two

modes that formed the basis for discussion. This chapter has argued that lifelong learning still has not been given adequate leverage within and across the SDGs to unlock its potential to deliver.

The lack of recognition across the SDGs of the contribution of lifelong learning, particularly its non-formal and informal modes, has implications for government policy and implementation of lifelong learning opportunities. This lacuna in the SDGs, in turn, will impact on government practices and subsequent monitoring and analysis reports. Such recognition would necessitate crafting of relevant guidelines and educational pedagogy that target pertinent social contexts. A more formalised recognition of this broader concept of lifelong learning within the SDGs would incentivise governments to put in place policies, plans, finances and other relevant provisions that would contribute directly to the SDG targets.

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4 Chinese and Western Development Approaches in Africa: Implications for the SDGs

Tobias Broich, Adam Szirmai and Ayokunu Adedokun

Abstract

This chapter discusses the entry of China into the game of foreign finance in Africa in an international comparative perspective. We present an analysis of long-run changes in the allocation of Western aid both globally and in Africa, along with estimates of the global sectoral allocation of Chinese aid. A similar analysis is also applied to China's foreign direct investment and international trade. While previous literature has predominantly attributed China's economic embrace of Africa to domestic factors, we argue that the sectoral distribution of Beijing's foreign aid—and partly foreign direct investment—is also affected by changes in the patterns of Western aid and investment flowing to the African continent. We provide quantitative evidence for long-run trends, switches and breaks in Western development assistance. China's foreign aid typically flows into Africa's physical infrastructure and productive sectors of agriculture and manufacturing, filling the vacuum which emerged when Western financial flows shifted to other activities, most notably capacity building and good governance reforms. While the increasing trade relationships between China and Africa are often described as South–South trade, the pattern highly resembles the typical North–South trade patterns. Overall, this chapter shows that financial resources from both the traditional Western donors and emerging donors from the Global South such as China can help African recipient countries to achieve the Sustainable Development Goals. China's development assistance in Africa may serve as a complement to the kinds of foreign aid provided by the traditional donor countries.

Keywords

China–Africa · Development · Foreign aid

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4.1 Introduction

At the Rio+20 Conference on Sustainable Development in Rio de Janeiro, Brazil, in June 2012, world leaders discussed a post-2015 development framework. One major outcome was the agreement by world leaders to establish an inclusive

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intergovernmental process for developing a set of Sustainable Development Goals (SDGs). Besides the traditional United Nations (UN) agencies, traditional Western donor agencies and international financial institutions, the BRICS countries (Brazil, Russia, India, China and South Africa) and other emerging economies have played an increasing role in shaping the post-2015 development agenda.

Emerging economies from the global south like China have entered the development arena and have positioned themselves as alternative sources of foreign finance to traditional or western donors, including the United States, Germany and United Kingdom. Among the emerging donors, however, China has grown to become Africa's largest development aid donor. China has now become Africa's largest bilateral trading partner and even outspends the US on an annual basis when it comes to development finance. Thus, Africa's economic and political fate cannot be analysed without paying attention to the emerging economic, political and strategic role of China on the continent (Ajakaiye and Kaplinsky 2009).

The goal of this chapter is to shed some light on the characteristics of China's rapidly growing economic ties with Africa—in particular in the field of development assistance/foreign aid—and its implications for the achievement of the SDGs in Africa. While China's deepening engagement with Africa is a complex issue with numerous interpretations, we find evidence that the Sino-African collaboration is based on the global value chain concept of mutual benefit—that is, China's engagement with Africa is a win–win scenario for both sides. The implication of our findings is that China's engagement with Africa provides significant opportunities for both sides and is therefore beneficial to the realisation of the SDGs in African countries.

The remainder of this chapter is structured as follows. Section 4.2 examines the magnitude and sectoral distribution of China's foreign aid, foreign direct investment and trade in Africa. Section 4.3 highlights trends and switches of Western development assistance over time. Section 4.4 discusses the similarities and differences of Chinese and Western foreign aid, foreign direct investment and international trade. We conclude the chapter by highlighting the main points in Sect. 4.5.

4.2 China's External Flows to Africa

4.2.1 The Magnitude of Chinese Foreign Aid Flows to Africa

Since the early 2000s, a myriad of emerging aid donors has intensified their development assistance on the African continent, of which China can be regarded as one of the most prominent ones. Figure 4.1 provides an overview of the evolution of China's foreign aid to Africa for the time period 1953–2013. China's foreign aid that is comparable to Western Official Development Assistance (ODA) consists of (i) external assistance expenditure and (ii) Export–Import Bank of China (EXIMBANK) concessional loans. At their introduction in 1996, concessional loans only represented 5.6% of the entire aid budget. Over time, however, concessional loans have become an integral part of China's aid budget accounting for more than a third of total aid by the year 2009. As concessional loans increasingly gain prominence as a foreign policy tool, it is likely that concessional loans will take on even greater significance in the aid budget in the near and distant future (Corkin 2011).

Before the 1990s, the volume of China's development assistance was rather small, except during the period 1970–1975. During the Cultural Revolution, especially in the early 1970s, the Beijing administration under Mao Zedong increasingly competed with Washington and Moscow for political support from African leaders. As a consequence, China provided large amounts of foreign aid despite significant domestic economic difficulties. The most famous project during that time was the construction of the Tanzania-Zambia Railway (TAZARA) between 1970 and 1975, a 1,860 km long project financed in the form of a long-term interest-free loan. Until today, the TAZARA project had been the largest single development assistance project

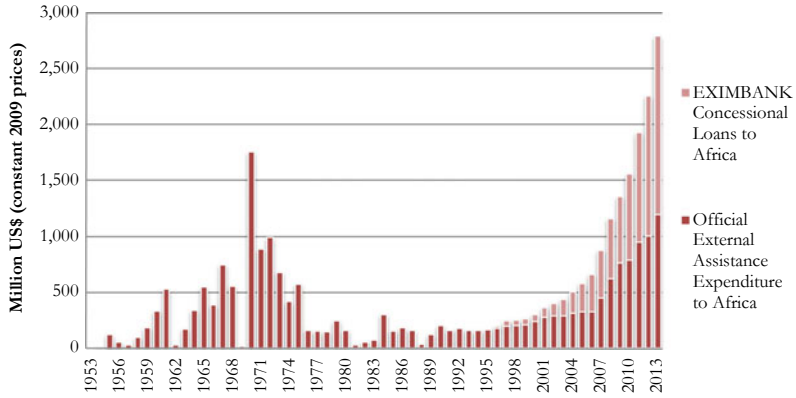

Fig. 4.1 Evolution of China's foreign aid to Africa, 1953–2013 (million 2009 US$) (Lin 1996; Kobayashi 2008; Bräutigam 2009, 2015; Bureau of Economic Analysis 2015; Authors' own estimations)

undertaken by China. Chinese development assistance declined substantially thereafter.

Table 4.1 compares the magnitude of foreign aid between China and Development Assistance Committee (DAC) donors and documents the African share of the total aid budget from the respective donor group. Since the mid-1990s onwards, Beijing's development assistance to Africa has risen exponentially. The Beijing government delivered US$ 135 million worth of development assistance in 1990. In 2013, foreign aid amounted to almost US$ 3 billion, a more than 20-fold increase in real terms since 1990. Note that China's mounting development assistance to Africa has evolved gradually but steadily since the early 1990s. The African share of total Chinese aid has increased over time as well. While China's foreign aid was only minimal compared to the total DAC aid in 1990, its magnitude in 2013 was equal to almost 10% of total bilateral Western aid. Over the last two decades, China has become an important donor country overtaking some of the traditional donor countries (Table 4.2).

Table 4.1 Comparison of Chinese and total western foreign aid to Africa, 1960–2013 (OECD International direct investment database; Bräutigam 2009; Author's own calculations)

	China (current US$ Million)		DAC donors (current US$ Million)	
Year	Africa	African share in total aid (%)	Africa	African share in total aid (%)
1960	58.0	20	1,286.1	31.2
1970	400.0	36	1,186.1	23.2
1980	71.0	36	6,344.3	42.0
1990	135.0	36	15,818.1	47.5
1996	152.0	37	12,858.4	38.4
2000	249.0	39	10,401.8	37.0
2005	535.0	40	24,661.8	34.7
2009	1,359.0	43	28,197.6	44.9
2010	*1,576.0*	*44*	29,370.6	44.0
2011	*1,993.0*	*44*	32,754.0	47.5
2012	*2,372.0*	*45*	30,493.7	47.7
2013	*2,985.0*	*45*	29,379.2	44.1

Notes Figures in italics are estimates by the authors. Figures are expressed in US$ Million. The African share in the Chinese aid budget for the years 2010–2013 is an estimation based on extrapolations of China's global and African aid budget

4.2.2 Chinese Trade and FDI

The evolution of China's foreign direct investment (FDI) in Africa compared to that of the major Western economies is portrayed in Table 4.3. Between 1985 and 2011 there was a huge increase in the stock of Western FDI in Africa. But in other parts of the world, FDI stocks were growing even more rapidly so that the share of Africa in global FDI stocks actually declined substantially between 1985 and 2000. After 2000, there was a strong recovery of the African shares. In the case of China, the share in global FDI declined between 1990 and 1995, but

Table 4.2 Comparison of Chinese and individual DAC donors foreign aid to Africa, 1990 versus 2013 (OECD/DAC database, Author's own calculations)

1990			2013		
Donor	Volume	% of DAC donors	Country	Volume	% of DAC donors
France	3,688.30	23.32	United States	9,667.45	32.15
United States	3,529.00	22.31	United Kingdom	3,922.49	13.05
Germany	1,823.31	11.53	France	3,168.33	10.54
Italy	1,294.14	8.18	China	2,985.00	9.93
Japan	1,069.46	6.76	Germany	2,397.41	7.97
Sweden	707.08	4.47	Japan	2,092.05	6.96
Netherlands	705.64	4.46	Canada	1,519.49	5.05
United Kingdom	572.16	3.62	Sweden	1,167.47	3.88
Canada	498.97	3.15	Norway	1,046.03	3.48
Norway	413.49	2.61	Netherlands	858.08	2.85
China	134.86	0.85	Belgium	583.14	1.94
DAC donors Total	15,818.13	100.00	DAC donors Total	30,067.53	100.00

Table 4.3 FDI stock in Africa by major countries of origin, 1985–2011 (OECD International direct investment database; IMF; UNCTAD FDI/TNC Database; UNCTAD 2006, 2013a; MOFCOM 2009, 2011)

	China		USA		France		UK	
	Africa (current US$ billion)	African share (%)	Africa (current US$ billion)	African share (%)	Africa (current US$ billion)	African share (%)	Africa (current US$ billion)	African share (%)
1985			5.89	2.6	1.62	3.1	6.72	7.2
1990	0.05	1.1	3.65	0.8	1.58	1.4	6.83	5.7
1995	0.06	0.3	6.02	0.9	3.85	1.9	7.68	3.9
2000			11.89	0.9	7.09	1.6	14.00	2.3
2005	1.60	1.9	22.76	1.0	21.51	2.3	35.86	5.2
2011	16.24	3.8	56.63	1.4	57.82	3.6	47.19	4.5

Notes Ministry of Commerce of the People's Republic of China (MOFCOM), Transnational Corporation (TNC), United Nations Conference on Trade and Development (UNCTAD)

from that year onwards the share increased steadily reaching 3.8% in 2011. While China's outward FDI has traditionally been highly concentrated in Asia, Beijing's going-global strategy has actively encouraged Chinese enterprises to look for expanding international and global market opportunities in other regions of the world, including Africa. While China's FDI stock on the continent was virtually zero in the mid-1980s, it rose to more than US$ 21 billion in 2012.

From the early 2000s onwards, emerging Southern economic giants such as the BRIC countries as well as Malaysia have joined the list of important investors on the African continent. While China has positioned itself as the major emerging donor in Africa, its FDI stock of around US$ 16 billion in 2011 falls short of Malaysia's foreign direct investment worth around US$ 19 billion in the same year (UNCTAD 2013b). The actual size of China's FDI stock on the continent may actually surpass

Table 4.4 Trade with Africa for selected countries, 1990 versus 2012 (Current US$ Million) (Authors' own calculations based on UN COMTRADE Database; Shinn and Eisenman 2012)

	1990			2012		
	Total Trade Volume With Africa (current US$ mill.)	African share of country's trade volume (%)	Country's share of Africa's trade volume (%)	Total Trade volume with Africa (current US$ mill.)	African share of country's trade volume (%)	Country's share of Africa's trade volume (%)
France	24,550	5.54	12.43	36,992	6.02	4.83
Germany	14,942	1.89	7.86	30,037	2.26	3.84
UK	7,364	1.79	3.73	32,433	4.33	3.33
USA	21,011	2.31	10.64	68,455	2.61	6.66
Japan	5,578	1.07	1.10	21,265	2.03	2.24
China[a]	1,696	1.02	0.73	113,244	5.13	13.04
India	996	2.39	0.50	43,017	9.03	4.62
Russia				2,224	1.12	0.62
Brazil	1,397	2.59	0.71	14,266	5.68	1.74

[a]We obtain only slightly different shares for China if compared to those obtained by Shinn and Eisenman (2012). With regard to the African share of China's trade volume, Shinn and Eisenman obtain values equal to 1.23, 2.10 and 4.25% for the years 1990, 2000 and 2012, respectively. With regard to the Chinese share of Africa's trade volume, Shinn and Eisenman obtain values equal to 0.73, 3.48 and 14.33% for the same years

Note The data for Germany and China correspond to the years 1991 and 1992, respectively

that of Malaysia as the figures may considerably understate the true amount of China's foreign direct investment (Shinn 2013).

China has emerged as the largest bilateral trading partner for Africa (Table 4.4). In the early 1990s, China's total trade volume with Africa was relatively small compared to that of France and the US. In spite of rapid increases, the absolute levels of Chinese foreign aid and foreign direct investment on the African continent remain modest. But with regard to trade, China has already become Africa's largest trading partner over the last couple of years. China's trade volume has surpassed that of Africa's traditional trading partners such as the United States, and the colonial powers France, United Kingdom and (to a lesser extent) Germany.

4.2.3 Sectoral Allocation of Chinese Aid

Table 4.5 provides an overview of the sectoral allocation of China's global foreign aid budget consisting of *grants*, *interest-free loans* and *concessional loans*. According to the figures released by the China State Council, the majority of China's 2025 completed projects financed through *grants* and *interest-free loans* in developing countries from 1950 until 2009 have either targeted the primary sector of the economy (agriculture but also mining oil and gas), the secondary sector of the economy (industry and manufacturing), public utilities or economic infrastructure. Those four sectors together made up more than 94% of all projects completed by Chinese engineers as well as Chinese workers and delivered as finished products to the recipient country (see Table 4.6).

At the same time, more than 90% of the *concessional loans* issued from 1996 until 2009 have targeted the development of economic sectors. China's high priority sectors have been economic infrastructure (61%) and productive sectors such as industry and agriculture (20%). The share of China's foreign aid flowing into the political and administrative infrastructure is virtually zero which is consistent with Beijing's principle of non-intervention in internal political affairs. The mutual non-interference in each

Table 4.5 Sectoral distribution of China's foreign aid, 1950–2009 (China State Council 2011)

Sector	Grants and interest-free loans, 1950–2009		Concessional loans, 1996–2009	
	Number of projects	% of total	Value (RMB¥ million)	% of total
Economic infrastructure	390	19.3	44.87	61.0
Energy and resources development	–		6.55	9.0
Industry	635	31.4	11.84	16.0
Agriculture	215	10.6	3.16	4.0
Public facilities	670	33.1	2.35	3.0
Others	115	5.7	4.78	7.0
Total	2025		73.55	

Note Completed projects refer to 'productive or civil projects constructed in recipient countries with the help of financial resources provided by China as grants or interest-free loans. The Chinese side is responsible for the whole or part of the process, from study, survey, to design and construction, provides all or part of the equipment and building materials, and sends engineers and technical personnel to organise and guide the construction, installation and trial production of these projects. After a project is completed, China hands it over to the recipient country' (China State Council 2011, p. 6)

Table 4.6 Sectoral distribution of China's completed projects, 1950–2009 (China State Council 2011)

Sector	# of projects	Sector (continued)	# of projects
Agriculture	**215**	**Industry**	**635**
Farming, animal husbandry, fisheries	168	Light industry	320
Water conservancy	47	Textiles	74
Public facilities	**670**	Radio and electronics	15
Conference buildings	85	Machinery industry	66
Sports facilities	85	Chemical industry	48
Theatres and cinemas	12	Timber processing	10
Civil buildings	143	Building materials processing	42
Municipal facilities	37	Metallurgical industry	22
Wells and water supply	72	Coal industry	7
Science, education and health care	236	Oil industry	19
Economic infrastructure	**390**	Geological prospecting	12
Transport	201	**Others**	**115**
Power supply	97	**Total**	**2025**
Broadcasting and telecommunications	92		

other's internal affairs is one of the Five Principles of Peaceful Coexistence, announced by the first Premier of the People's Republic of China, Zhou Enlai, in 1954.[1]

At the time of writing in October 2018, no official information about the sectoral distribution patterns for the African continent has been available for the period under investigation. Since the African continent is China's largest aid recipient, it is safe to assume that the sectoral distribution of China's aid in Africa strongly resembles the global pattern illustrated in Table 4.6.

[1]The other four principles of Peaceful Coexistence are (i) mutual respect for sovereignty, (ii) mutual non-aggression, (iii) equality and mutual benefit and (iv) peaceful coexistence.

4.2.4 Geographical Distribution of Chinese Aid

The resource-rich endowments of countries like Sudan, Angola, Democratic Republic of Congo (DRC) and Nigeria are natural targets for China's rapid economic embrace of the continent (Table 4.7). On the grounds of non-interference in political affairs, Beijing enjoys a comparative advantage in dealing with autocratic elites: China's ability to position itself as an alternative partner to the West enables Beijing not only to establish political relationships with authoritarian governments but it can also derive direct economic benefits from it (Alden 2005; Tull 2006). This is only half the story, however, Ghana, a relatively resource-scarce country—compared to other African countries—and an exemplar for a successful democratic transition during the post-Cold War era in Africa, also receives a considerable portion of Beijing's foreign aid. The inclusion of another resource-scarce country such as Ethiopia, as well as countries like Egypt and South Africa in the top ranks of Chinese aid recipients emphasises the importance of geo-strategic considerations in China's aid policy.

More than half of China's FDI is concentrated in oil—or mineral-rich countries such as Nigeria, South Africa, Zambia, Angola, Sudan and more recently the DRC. The distribution of foreign direct investment remains highly skewed, with a few host countries receiving the largest share of investment. Those recipient economies are generally characterised by a relatively high abundance of natural resources, sea access and large

Table 4.7 Regional distribution of China's external flows to Africa, 2011/2012 (Authors' calculations from databases)

Foreign aid 2012			FDI stock 2011			Two-way trade 2012		
Country	Volume (current US$ million)	% of total	Country	Volume (current US$ million)	% of total	Country	Volume (current US$ million)	% of total
Sudan	201.76	8.08	South Africa	4,775.00	21.97	South Africa	59,977.00	30.24
Ethiopia	201.51	8.07	Zambia	1,998.00	9.19	Angola	37,601.10	18.96
Congo, DR	186.78	7.48	Nigeria	1,950.00	8.97	Nigeria	10,570.10	5.33
Nigeria	185.53	7.43	Algeria	1,305.00	6.01	Egypt	9,544.70	4.81
Angola	154.31	6.18	Angola	1,245.00	5.73	Libya	8,760.10	4.42
Ghana	152.07	6.09	Sudan	1,237.00	5.69	Algeria	7,728.60	3.90
Zimbabwe	144.58	5.79	Congo, DR	970.00	4.46	Ghana	5,434.30	2.74
Equat. Guinea	142.58	5.71	Zimbabwe	875.00	4.03	Congo, Rep.	5,076.40	2.56
Cameroon	111.12	4.45	Mauritius	701.00	3.23	Congo, DR	4,364.60	2.20
South Africa	88.89	3.56	Ethiopia	607.00	2.79	Sudan	3,732.90	1.88
Others	927.89	37.16	Others	6,067.00	27.92	Others	45,543.20	22.96
Total	2,497.00	100.00	Total	21,730.00	100.00	Total	198,332.90	100.00

Notes With regard to foreign aid, the country data for the year 2012 is an estimate calculated by the authors based on information provided by Bräutigam (2009) and Strange et al. (2013). With regard to FDI, we use data from MOFCOM (2009, 2011) and UNCTAD (2014). The trade data are authors' own calculations based on data from UN COMTRADE Database

expanding economic markets. The geographical composition of China's trading volume has become highly skewed in favour of a few major trading partners. Thus, South Africa's and Angola's bilateral trade with China accounted for almost 50% of China's total trade volume with Africa in 2012.

4.3 Changing Sectoral Allocation of Western Foreign Aid

Over the last fifty years, Western ODA was characterised by many switches and fluctuations (Riddell 2007; Szirmai 2015). Unfortunately, detailed data at the sectoral level is only available from 1967 onwards for global bilateral aid and from 1973 onwards for Africa (Tables 4.8 and 4.9).

Table 4.8 presents the changing sector structure of global bilateral ODA; Table 4.9 does the same for Western bilateral ODA disbursements for Africa. The global trends in Table 4.8 and the African trends in Table 4.9 are in many ways similar, though the shifts in Table 4.8 are even more marked than those of Table 4.9 focusing on Africa. In Table 4.9, the figures in italics for 2005 and 2012 are estimates and interpolations by the authors. For these years, a detailed sectoral breakdown of aid to Africa under the heading social infrastructure is not available (with the exception of data for the education sector). By deducting the share of education, we obtain the shares of total other social infrastructure sectors for those two years. These shares are then divided among the sub-sectors of other 'Social Infrastructure' by applying the proportions for these sub-categories from Table 4.8.

Initially, Western development aid was highly focused on infrastructural and industrial development. In the late 1960s, almost 30% of global bilateral ODA flowed into physical infrastructure projects (road construction, transport, telecommunications, electricity supply, etc.). In 1973, the share of African ODA disbursements flowing into physical infrastructure projects and the production sector accounted for 30.6 and 12.4% respectively. By 2005, however, the infrastructure and production sector together only accounted for 13.8%. The share of African bilateral ODA disbursements allocated to the physical infrastructure sector declined even more rapidly than the share of global bilateral ODA disbursements targeting that sector.

Meier (1984) provides qualitative evidence that the emphasis on physical infrastructure development was even more pronounced in the early post-war period. Influential writings in the 1950s and 1960s identified lack of capital and

Table 4.8 Sectoral distribution of total bilateral net ODA disbursements to the World, 1967–2012 (Authors' own calculations based on OECD/DAC Statistics)

Sector	1967	1970	1975	1980	1985	1990	1995	2000	2005	2012
Social infrastructure	8.3	11.5	20.6	23.2	22.8	19.3	24.9	25.5	26.1	34.6
Education	0.0	0.0	11.1	13.9	11.2	9.8	11.2	7.8	5.9	8.2
Health	0.0	0.0	4.6	5.2	5.1	2.8	4.0	3.6	3.6	5.6
Population and reproductive health	0.0	0.0	0.0	0.0	0.3	1.0	1.6	2.4	3.3	6.5
Government and civil society	0.0	0.0	1.4	1.1	2.2	3.0	3.3	5.0	9.6	12.2
Other social infrastructure and services	8.3	11.5	3.5	3.1	4.1	2.8	4.8	6.7	3.7	2.1
Physical infrastructure	27.8	15.3	11.8	19.3	17.9	16.6	27.6	19.3	13.7	19.8
Transport and storage	11.1	6.4	2.5	9.2	5.8	6.4	10.1	8.7	5.2	7.7
Communications	3.2	2.3	1.8	1.9	2.2	2.2	1.6	0.9	0.4	0.4
Energy	13.5	6.6	5.4	6.6	7.3	4.9	10.1	3.2	3.3	5.9
Water supply and sanitation	0.0	0.0	2.1	1.5	2.6	3.2	5.7	6.4	4.7	5.8
Production sectors	36.6	18.2	22.6	25.1	20.9	12.8	12.6	10.8	7.3	10.6

(continued)

Table 4.8 (continued)

Sector	1967	1970	1975	1980	1985	1990	1995	2000	2005	2012
Agriculture, forestry, fishing	7.0	8.0	8.6	11.5	13.0	7.5	7.4	5.1	3.4	5.5
Industry, mining, construction	29.6	10.2	6.2	5.5	5.4	3.4	1.6	1.7	1.4	1.4
Trade policies and regulations	0.0	0.0	0.0	0.0	0.3	0.8	0.2	0.1	0.4	0.6
Tourism	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.1	0.1
Banking and financial services	0.0	0.0	0.0	0.0	1.4	0.3	0.8	0.5	1.1	2.0
Business and other services	0.0	0.0	0.7	0.3	0.4	0.7	1.2	3.3	0.8	1.0
Non-specified by sector	0.0	0.0	7.2	7.8	0.0	0.1	1.4	0.1	0.0	0.0
Multi-sector/cross-cutting	0.0	1.2	2.1	2.0	1.2	3.2	4.9	8.1	6.2	9.7
Commodity aid/General prog. ass.	10.1	41.1	19.1	10.5	24.5	14.2	5.8	7.0	2.6	3.1
Action relating to debt	6.5	4.3	4.1	5.7	2.5	23.2	7.3	7.7	26.8	2.8
Humanitarian aid	0.0	0.0	1.3	1.8	2.2	2.0	4.4	4.6	8.3	8.1
Unallocated/unspecified	10.8	8.4	18.4	12.4	7.9	8.5	12.7	16.9	9.2	11.2

Table 4.9 Sectoral distribution of total bilateral net ODA disbursements to Africa, 1973–2012 (Authors' own calculations based on OECD/DAC Database and OECD 2003)

Sector	1973	1980	1985	1990	1995	2000	2005	2012
Social Infrastructure	14.1	7.6	10.7	10.0	26.3	29.8	24.7	36.1
Education	3.9	3.0	4.3	2.5	5.1	9.1	7.3	8.3
Health	2.0	1.8	2.5	2.4	4.8	5.4	*3.1*	*5.9*
Population and reproductive health	0.5	0.3	1.0	1.2	2.2	5.2	*2.8*	*6.8*
Government and civil society	6.1	0.3	2.2	2.8	9.7	6.6	*8.2*	*12.9*
Other social infrastructure and services	1.7	2.3	0.7	1.1	4.5	3.5	*3.2*	*2.2*
Physical infrastructure	30.6	29.7	22.0	23.9	21.1	10.6	8.3	18.6
Transport and storage	12.5	14.8	6.6	7.9	5.6	3.3	3.9	7.2
Communications	4.5	4.4	2.2	2.4	1.4	1.3		
Energy	8.9	6.7	5.3	6.9	6.1	1.6	2.2	5.3
Water supply and sanitation	4.7	3.8	7.9	6.7	8.0	4.4	2.2	6.1
Production sectors	12.4	17.4	20.4	18.2	12.0	15.5	5.5	10.2
Agriculture, forestry, fishing	6.7	11.9	12.9	12.2	8.6	7.1	2.8	6.6
Industry, mining, construction	2.7	5.0	6.1	3.4	1.0	2.5	0.5	0.9
Trade policies and regulations	0.1	0.1	0.0	0.1	0.2	0.2	0.5	0.5
Tourism	1.5	0.1	0.1	0.4	0.0	0.0		
Banking and financial services	1.4	0.3	1.3	2.1	1.3	0.9	1.7	2.3
Business and other services	0.0	0.0	0.0	0.0	0.9	4.8		
Multi-sector	1.0	5.1	3.1	7.2	8.1	9.2	5.2	6.3
Commodity aid/general progr. assist.	32.4	26.7	33.8	22.5	13.0	13.5	5.3	5.9
Debt relief	1.0	10.7	4.9	16.5	14.1	13.2	36.9	8.2
Humanitarian aid	0.7	1.1	3.8	1.1	4.6	7.1	11.9	12.4
Unspecified	7.8	1.6	1.3	0.6	0.8	1.1	2.2	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

infrastructure as developmental constraints and further examined the role of aid in providing sufficient funds for physical capital accumulation (Nurkse 1953; Rosenstein-Rodan 1961). With developing countries seen as being caught in a poverty trap, big-push investment programmes were advocated to address infrastructural obstacles prominent in most low-income countries.

Influenced by Theodore Schultz' (1956) early seminal contributions on agricultural economics, increasing attention was paid to investment in the agricultural sector, resulting in major increases in the share of this sector in total aid allocations till 1985 (both globally and in Africa). Rural development programmes and agricultural production were put at centre stage of Western development strategies, especially in the context of Sub-Saharan Africa. After 1985 (globally) and 1990 (Africa), however, the share of aid going to agriculture rapidly declined.

The second oil shock in 1979 and the debt crisis of 1982 heralded the start of the implementation of structural adjustment programmes by the International Monetary Fund (IMF) and World Bank in a variety of developing countries. Economic thought during that period was heavily influenced by earlier work of Bauer (1972) and Friedman (1958). Bauer and Friedman were two of the most ardent critics of foreign aid, seeing development assistance as a powerful force that undermines economic activity in the private sector. Due to aid flows, governments would face less pressure to build a business environment suitable for private (domestic) enterprises, which were considered to be the ultimate engine of growth in a capitalist economy. The 'golden era' of development aid witnessed in the 1960s and 1970s came to a halt as the focus on development strategy shifted towards internal domestic policy failure and the implementation of prudent macroeconomic policies. As a result, the era just before the end of the Cold War was increasingly characterised by structural adjustment programmes and debt relief. Meanwhile, development projects aimed at health, education and poverty alleviation were cut back significantly (Riddell 2007).

In the 1990s, the donor community became increasingly disenchanted with the effectiveness of structural adjustment and conditionality. One response to the disappointment with the outcomes of structural adjustment programmes of the 1980s and early 1990s was an increasing emphasis on poverty reduction. The importance of poverty reduction had already been emphasised since the 1970s but gained increasing force in the wake of structural adjustment. Thus, countries were required to draw up poverty reduction strategy papers in order to qualify for debt relief.

A second important response to the perceived failure of structural adjustment was an increased emphasis on far-reaching institutional reform and good governance. Political conditionality was regarded as a necessary condition for enhanced aid effectiveness and as a useful tool for promoting democratic governance and institutional reform in the least developed countries. While the share of African ODA flowing into civil society strengthening, as well as local and national government support (what we could call 'political infrastructure') amounted to only 0.35% in 1980, 12.9% of total ODA flowed into this sector by 2012.

In sum, for a variety of reasons, from the mid-1980s onwards, donor countries started to shift the focus away from (i) infrastructure projects and (ii) production sectors. The share of ODA flowing into African social infrastructure and capability building has steadily increased over the last three decades. This process reached its apex around 2005. Between 2005 and 2012, the shares of production sectors and infrastructure share have bounced back, possibly in response to the Chinese embrace of the African continent. But the long-run trend remains unmistakable.

Table 4.10 displays the evolution of total World Bank lending (both loans and credits) to Sub-Saharan Africa by sector over time. World Bank lending serves as our proxy for the

Table 4.10 Sectoral distribution of World Bank lending to Sub-Saharan Africa, 1946–2011 (World Bank annual reports (various); Krueger et al. 1989; Lumsdaine 1993)

Sector	1946–71	1977		1991		2003		2011	
	%	Volume	%	Volume	%	Volume	%	Volume	%
Social infrastructure		52.1	5.5	3,876.5	10.0	1,921.2	51.4	2,944.6	41.7
Education		52.1	5.5	2,437.3	6.3	423.6	11.3	497.6	7.0
Population and health		–	0.0	1,131.5	2.9	775.9	20.8	591.4	8.4
Government and civil society		–	–	307.7	0.8	721.8	19.3	1,855.6	26.3
Physical infrastructure	>75.0	345.6	36.6	15,753.7	40.8	1,352.6	36.2	2,732.6	38.7
Transport and storage		167.6	17.7	7,081.6	18.3	690.5	18.5	937.9	13.3
Communications		–	0.0	862.3	2.2	41.4	1.1	259.0	3.7
Energy		112.0	11.9	4,272.3	11.1	324.4	8.7	890.1	12.6
Water supply and sanitation		22.0	2.3	1,735.3	4.5	296.3	7.9	645.7	9.1
Urbanisation		44.0	4.7	1,802.2	4.7	–	–	–	–
Production sectors		489.2	51.8	13,068.7	33.8	463.3	12.4	1,382.8	19.6
Agriculture, forestry, fishing	10.4	377.9	40.0	9,347.5	24.2	303.4	8.1	843.1	11.9
Industry and trade		53.6	5.7	711.6	1.8	92.7	2.5	432.8	6.1
Banking and financial services		57.7	6.1	2,340.2	6.1	67.2	1.8	106.8	1.5
Business and other services		–	–	669.4	1.7	–	–	–	–
Nonproject		45.0	4.8	5,071.1	13.1	–	–	–	–
Technical assistance		12.4	1.3	876.1	2.3	–	–	–	–
Total		944.3	100.0	38,646.1	100.0	3,737.2	100.0	7,060.0	100.0

Notes Volumes are expressed in current US$ million. Our sectoral classification slightly deviates from the sectoral classification by the World Bank. We have reallocated 'Water Supply and Sanitation' from social infrastructure to physical infrastructure, but also 'Banking and Financial Services' and 'Business and Other Services' from social infrastructure to the productive sector. Categories have been subject to change due to a new thematic-sectoral coding system installed in the year 2003. Share of Physical Infrastructure for the period 1946–1971 refers to the World Share of Agriculture, Forestry and Fishing refers to World and covers the period 1948–1972. Lending includes both IDA and IBRD lending

evolution of Western multilateral development assistance over time. The results are very similar to our findings for Western bilateral development assistance.

While approximately 75% of World Bank lending between 1946 and 1960 targeted physical infrastructure development, primarily transport, power generation and telecommunications, the share fell to 36.6% in 1977 and stayed at around that level till 2011. The share of agriculture dropped from a peak of 40% in 1977 to 8.1% in 2003, before rebounding to 11.9% in 2011. It had become a relatively low-priority sector in the mid-2000s, even though around 82% of the rural Sub-Saharan population lives in agriculture-based countries (World Bank 2007). In a similar vein, World Bank lending into industrial projects has slid from only 5.7% in 1977 to a meagre 1.8% in 1991. While the share increased somewhat since then, the amount of funding channelled into industrial related projects remains negligible.

Another sector which has witnessed a decline in relative terms is the transport sector. These declines contrast with the increasing importance of judicial and public administrative capacity building. While only 0.8% of World Bank lending went into judicial and public administrative capacity building shortly after the fall of the Iron Curtain, the share rose to 26.3% in 2011.

Thus, both bilateral and multilateral development assistance have increasingly emphasised judicial and public administrative capacity building at the expense of physical infrastructure development and the fostering of productive sectors.

The increasing emphasis of Western development assistance on the political and institutional infrastructure in a recipient country, seen as one of the ultimate sources of growth and development and key to the implementation of the Sustainable Development Agenda, goes hand in hand with a considerable decline in resources made available for specific productive sectors such as industry and trade, agriculture, fishing and forestry or (iii) transportation, which belong to the more proximate sources of growth (Maddison 1988; Szirmai 2012).

4.4 Aid, Investment and Trade: Similarities and Differences

The Chinese aid system drastically differs from the Western system in at least two ways: First, Chinese aid funding is embedded into a wider foreign policy framework characterised by the non-interference in internal affairs and Beijing's upholding of political equality with recipient states. While most of the Western development aid in recent years is characterised by political conditionality and aid selectivity, the bulk of Southern development assistance comes with relatively 'few strings attached'. In contrast to most 'traditional' donors, Southern donors impose little or even no macroeconomic or governance conditionality based on the principles of respect for national sovereignty and non-interference in domestic affairs.[2] In the eyes of African recipient governments, China's aid is viewed as a welcome alternative to Western aid linked to political conditionality and aid selectivity—despite the fact that much of Beijing's development assistance in Africa is tied to the purchase of Chinese goods and services or to Chinese access to African natural and energy resources.

Second, Chinese and Western development aid flows are based on different core development ideas and ideologies. Among traditional donor countries, aid conditionality and aid selectivity are nowadays viewed as necessary condition for enhanced aid effectiveness and as useful tool for promoting democratic governance and institutional reform in developing countries. Influenced by theoretical underpinnings by authors such as North (1990), or Acemoglu, Johnson and Robinson (2001), the aforementioned approach stresses the significance of the ultimate sources of growth, namely (political) intangibles offered by major Western actors, for example capacity building, democratisation, adherence to human rights principles, rule of law and good governance.

The increasing emphasis of Western development assistance on the (political) intangibles of development, such as capacity building and governance, is in marked contrast to Beijing's emphasis on the (economic) tangibles of development such as productivity gains in agriculture, industrial processing, or the refurbishment of physical infrastructure. The patterns of China's aid remarkably resemble ideas put forward in the big-push literature which claims that publicly coordinated investment can break the cycle of poverty (Nurkse 1953; Rosenstein-Rodan 1943, 1961).

Beijing's present foreign aid with its focus on infrastructure and the productive sector is highly reminiscent of the approach of Western foreign aid policy in the 1960s. In contrast to traditional development assistance, however, China's sectoral allocation has been relatively stable over time compared to the erratic patterns of Western foreign aid with its trends, switches and sudden breaks. Chinese authorities have spotted the vacuum and actively contribute to filling the gap by aiding the majority of African countries in the productive sectors of the economy. This makes China a major financier and builder of infrastructure and holds promise for the provision of the necessary financial resources to attain the SDGs in the area of physical infrastructure. The

[2]The notable exception from China's rejection of political demands is Beijing's One China Policy.

divergent development ideologies utilised by both Western donors and emerging partners correspond to an expansion of the choices available for African development of how specific SDGs can be attained.

Regarding FDI, we observe some similarities between Chinese and Western FDI in Africa, but also some distinct differences. Before China's surge of private investment on the African continent, most of Western FDI has taken place in resource extractive industries, and in recent years increasingly in service sectors. The majority of Western firms has disengaged from African manufacturing. Like Western resource-seeking FDI, a large fraction of investment carried out by Chinese state-owned enterprises predominantly takes place in resource extraction. Beijing becomes increasingly dependent on the extraction of foreign natural resources to fuel its domestic economic growth. When comparing China's resource extractive activities as a proportion of both its global and African FDI stock (14% vs. 29.2%), we see that investment in resource extractive sectors are twice as important on the African continent (Table 4.11).

One of the sectors in several African economies which has witnessed a major influx of investment flows from China is the manufacturing sector. While Chinese investors have paid relatively little attention to investments in manufacturing industries on a global scale, manufacturing FDI from China has played a much more important role on the African continent. The bulk of investment by Chinese State-Owned Enterprises (SOEs) tends to be assigned to big projects related to natural resource extraction, contracting and service sectors such as telecommunications or the large-scale refurbishment of physical infrastructure. These projects are often linked to concessional loans and economic cooperation projects thereby signifying the strong nexus to aid funding. Manufacturing FDI

Table 4.11 Sectoral distribution of China's outward FDI stock, 2010 (China State Council 2010, 2013; MOFCOM 2011)

	Africa[a]		World	
Sector	Volume[b] (current US$ mill.)	% of China's total outward stock in Africa	Volume (current US$ mill.)	% of China's global outward stock
Mining/resource extraction	2,724.9	29.2	44,660.6	14.1
Manufacturing	2,053.0	22.0	17,801.7	5.6
Construction	1,474.5	15.8	6,173.3	1.9
Finance	1,297.2	13.9	55,253.2	17.4
Transport, storage and post	503.9	5.4	23,187.8	7.3
Leasing and business services			97,246.1	30.7
Wholesale and retail trade	373.3	4.0	42,006.5	13.2
IT	298.6	3.2	8,406.2	2.7
Real estate	–	–	7,266.4	2.3
Others	317.3	3.4	15,208.8	4.8
Agriculture	289.3	3.1		
Total	9,332.0		317,210.6	

[a]Figures for Africa refer to the year 2009
[b]The volumes with respect to each sector are estimated by multiplying the sectoral share with China's total FDI stock in Africa for the year 2009

Table 4.12 China's trade with selected African countries by sector, 2012 (%) (Authors' calculations based on World Bank WITS database)

	Imports from Africa (in % of total imports)						Exports to Africa (in % of total exports)		
	Extraction of oil and gas			Mining			Manufacturing		
	China	EU	USA	China	EU	USA	China	EU	USA
Algeria	99.8	84.8	56.7	0	0.3	0	99.4	98.7	88.6
Angola	99.4	90.4	94.3	0.4	5.8	0.8	99.7	99.4	98.3
Cameroon	56.1	52.9	15.0	0	0	0	98.9	99.0	96.5
DRC	20.5	0	0	11.5	28.6	40.2	98.5	99.5	91.2
Egypt	66.6	44.2	45.7	18.4	1.3	0.4	98.1	97.3	74.7
Ethiopia	0	0	0	3.7	0	3.6	99.9	99.5	59.5
Ghana	52.9	68.6	0	28	5.5	0.7	99.9	99.6	97.0
Kenya	0	0	0	24.2	1.9	0	99.7	99.3	87.6
Libya	100.0	95.3	90.2	0	0	0	98.7	97.0	97.4
Morocco	0	0	0	30.1	5.1	33.9	99.3	96.3	76.0
Mozambique	0	0	0	35.1	9.0	46.3	99.7	99.8	91.2
Nigeria	81.8	96.2	92.9	5.5	0	0	99.9	99.6	79.9
South Africa	2.4	0	0	60.3	18.0	7.2	99.3	94.8	96.9
Sudan	96.8	0	0	0.3	0	0	99.3	98.4	33.6
Tanzania	0	0	0	58.3	20.1	1.2	99.9	99.7	97.1
Zambia	0	0	0	1.6	8.8	2.6	100.0	99.6	99.9

only plays a negligible role for Chinese SOEs. In contrast, small or medium-sized private companies tend to be concentrated in manufacturing and wholesale trade.

Compared to remarkable differences in the sectoral distribution between Western and Chinese development assistance, but also to some extent with respect to Western and Chinese FDI, the trade patterns of both the West and China with Africa tend to be remarkably similar. Table 4.12 shows the sectoral distribution of Chinese, European and US trade flows at the *country level* for the year 2012. European and US imports from several African countries mainly comprise crude materials and mineral fuels. Manufactured goods form the lion's share of exports in many African trading countries. With regard to our selected countries, we observe that China's imports are even more highly concentrated in the resource sector compared to those of the United States and the European Union. While the increasing trade relationships between China and Africa are often described as South–South trade, the pattern highly resembles the typical North–South trade patterns. The evolution of Sino-African trade patterns mirrors Ricardo's law of (static) comparative advantage. Relative factor endowments of labour, capital and natural resources are largely responsible for the dichotomous nature of Sino-African trade patterns.

4.5 Concluding Remarks

As mentioned above, the SDGs can deepen the interactions between Africa and its development partners. Overall, this chapter shows that financial resources from both the traditional Western donors and emerging donors from the Global South such as China can help African recipient countries to achieve the SDGs. While Western development assistance remains strong in social sectors such as education and health, it increasingly focuses on

political and institutional development as well. Political and institutional factors can be regarded as ultimate sources of growth and development. Chinese development finance, in turn, focuses specifically on physical infrastructures such as transportation as well as industry and trade, which can be considered as proximate sources of growth and development. Consequently, China's development assistance in Africa may serve as a complement to the kinds of foreign aid provided by the traditional donor countries.

Development finance can make an important, albeit limited, contribution to the developmental progress in developing countries. But the exaggerated expectations that development finance acts as a fundamental tool to meet the SDGs only further undermines the effectiveness of development finance. Increased development cooperation in the realms of foreign aid, trade and investment is a necessary but not sufficient condition for progress on development indicators in the developing world, as domestic policy factors play the most fundamental role in achieving developmental progress. The Millennium Development (MDG) agenda [as well as the post-2015 development agenda] have implied and will imply 'fundamental transformations in society, which are invariably driven by domestic politics and local actors' (Vandemoortele 2011, p. 1). With regard to the post-2015 UN Development Agenda, the most pressing question is not (i) whether both traditional donors and non-traditional donors will strengthen their cooperation in developing countries or (ii) whether Western and BRICS development finance will become increasingly competitive or complementary, but rather whether developing countries will be able to fully exploit the advantage of their new sources of funding, ideas and cooperation.

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5 The AU's African Governance Architecture and SDG 16: Examining Intersections

David Mickler and George Mukundi Wachira

Abstract

This chapter analyses the intersection of the African Union's African Governance Architecture (AGA) and SDG 16 on Peace, Justice and Strong Institutions, which aims to 'promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels'. The AGA is a political and institutional framework mandated by the African Union (AU) in 2011 to define, promote and regulate the body's Pan-African democratic governance agenda and to coordinate key institutions and stakeholders in pursuit of this agenda. The architecture aligns with the AU's long-term continental development blueprint, Agenda 2063, including the key aspiration of 'An Africa of good governance, democracy, respect for human rights, justice and the rule of law'. The chapter proceeds in two main parts. First, drawing on the notion of African agency, it analyses the process by which African actors influenced the negotiation of the UN 2030 Agenda. By linking governance reforms at national, regional and global levels, and by linking governance, security and development, the eventual inclusion of SGD 16 can be viewed as a success for African negotiators. Second, it explains the mandate and design of AGA and identifies the main opportunities and challenges in going beyond an alignment of principles and agendas at the macro level to facilitate the effective implementation of SDG 16 targets in African countries.

Keywords

SDG 16 · African Union · African Governance Architecture · African agency · Governance

5.1 Introduction

The analysis in this chapter is situated at the intersection of two contemporary macro development frameworks finalised in 2015, the United Nations (UN) 2030 Agenda for Sustainable Development, containing the Sustainable Development Goals (SDGs), and the African Union's (AU) Agenda 2063: The Africa We Want. While the 2030 Agenda is global in scope and has 15-year timeframe, Agenda 2063 is continental to Africa and has a time horizon of 50 years. In this context, we specifically examine relationships between SDG 16 on Peace, Justice and Strong Institutions, and the African Governance Architecture (AGA). The AGA was mandated in

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2011 as the AU's overall political and institutional framework for defining, promoting and regulating democratic governance on the continent. While there is clear overlap between SDG 16 and AGA, they were developed through separate processes: the SDGs via UN-led global negotiations, which involved substantial African input, and AGA via AU-led continental processes, which involved external partners (see also Corrigan and Gruzd 2017).

We first examine notions of (pan)African agency and ownership, which in contexts of global power inequalities have underpinned attempts by African governments over the past two decades to take a more proactive and interventionist approach to continental governance through the AU while asserting African common interests and positions in negotiating global policy agendas. We argue that this has had two relevant outcomes here: first, it has legitimised the AU as the principal organisation 'owning' and managing African continental affairs, including the governance agenda; and second, it has enabled the AU to credibly link reform of African governance to reform of global governance, arguing for more democratic and equitable decision-making processes in international organisations. As global negotiations are themselves a fundamental governance process (as recognised in the SDGs), we demonstrate how such dynamics resulted in collective African positions being developed and then asserted in negotiations over what became the UN 2030 Agenda. As Welz (2013, p. 426) argues, engaging in governance 'means being able to influence forms of cooperation, rulemaking, and policy implementation by, for instance, introducing new positions that are reflected in later governance structure[s] and governance processes' (see also Arthur 2018).

In the second part of the chapter, we explain the mandate and design of the AGA and analyse the dynamics shaping AGA's ability to move beyond the alignment of agendas at the macro level to the effective implementation of SDG 16 targets in African countries. We argue that AGA has the tools to perform this role but remains constrained by critical challenges.

5.2 African Agency in Continental and Global Governance Reform

Working collectively through the AU system, African governments have developed a more proactive and interventionist approach to managing continental affairs (although applied inconsistently in practice) while simultaneously more firmly asserting African common interests and positions in global negotiations (see Brown and Harman 2013; Zondi 2013). As Vickers (2013, p. 675) argues, 'it is significant that African countries in their individual and collective capacities are increasingly active, assertive and confident players on the word stage, influencing international negotiations in areas ranging from multilateral trade to climate change', even though there remains substantial structural constraint on African governments' 'bargaining power' in the international system. For example, while Africa is now the largest regional bloc in the UN, the lack of an African permanent member of the UN Security Council and unequal voting structures in Bretton Woods institutions have marginalised African countries from global decision-making power. As a result, major external security and economic interventions in the continent's affairs have typically reflected foreign and elite interests that have undermined more sustainable and indigenous responses to African challenges.

This was often coupled with a failure by African governments, either individually or collectively, to manage acute human development, security and governance crises across the continent. While the Organisation of African Unity (OAU, 1963–2002) was successful in delegitimising colonialism, supporting self-determination and initiating regional economic integration, the OAU's non-interventionist norms rendered it largely impotent in alleviating crises within African states and often shielded governments from accountability (Makinda et al. 2016; Gasu 2013). For example, protracted conflicts, fragile governance institutions, and opaque and corrupt governments controlled by 'strong men' violated human rights, hindered service delivery and reduced avenues to channel discontent, often

leading to further instability, conflict and unfulfilled development. In the context of these political dynamics, during the 1990s a coalition of African and external actors sough to develop a new and transformational regionalism that would be more proactive and interventionist (see Edozie 2014; Tieku 2016).

This resulted in the transformation of the OAU into the AU, underpinned by a new mandate and set of institutions that promised to drive an 'African Renaissance' and facilitate greater pan-African agency in both continental and global governance. For example, the preamble of the AU Constitutive Act (CAAU) states that African governments are determined to address the multifaceted challenges that the continent and its peoples face in light of regional and global changes (AU 2000). The AU aims to 'promote and defend African common positions on issues of interest to the continent and its peoples' (Article 3[d]) and to 'establish the necessary conditions which enable the continent to play its rightful role in the global economy and in international negotiations' (Article 3[i]). Such continental interventionism, recasting the norm of non-intervention as one of a more proactive 'non-indifference', is mandated in the CAAU by Article 4(h), which gives the AU the right to intervene in a member state following a determination of grave circumstances (AU 2000). A range of institutions have been established to operationalise these principles, including the AU Peace and Security Council for continental regulation and Common African Positions (CAPs) for influencing global negotiations. As Zondi (2013, p. 20) elaborates:

> In its attempt to uncover its agency, by which we mean its ability to exert influence in international negotiations, Africa is using common negotiating positions, in order to produce negotiation outcomes that benefit weak African countries. Common negotiating positions demonstrate, to an extent, the value of its activism by enabling it to impact on a complex power system designed to place it on the margins.

These objectives were reaffirmed in 2013 with the OUA/AU's 50th Anniversary Solemn Declaration, which indicated that the organisation was guided by the vision to 'build an integrated, prosperous and peaceful Africa, driven and managed by its own citizens and representing a dynamic force in the international arena' (AU 2013). From this emerged the AU's Agenda 2063, the long-term plan for continental integration and sustainable development (AU 2015). Among the core aspirations of Agenda 2063 is 'a prosperous Africa based on inclusive growth and sustainable development' characterised by good governance, democracy, rule of law and influence as a united and strong global player (AU 2015). On the latter, the development of CAPs has supported greater agency of African states and regional organisations in asserting united positions in global governance negotiations. For Welz (2013, p. 437), the 'question of unity within the AU and the adoption of common positions are crucial to explaining whether the AU was successful in engaging in governance outside Africa; that is, in seeing that its positions vis-à-vis global governance processes and structures become a reality'.

5.2.1 African Agency and the UN 2030 Agenda

Because equitable negotiation of the global agenda is a critical governance process, there are important linkages between governance reforms at the continental and global levels. Indeed, following widespread criticism of the shortcomings of stakeholder engagement in the development of the MDGs, there was a more conscious effort to improve consultation mechanisms for the 2030 Agenda (see Sparks 2016; Dodds et al. 2017). The 2030 Agenda commits to increased participation of developing countries in global governance (UN 2015). In particular, SDG 16.8 and 17, respectively, promote participation of developing nations in global governance institutions and commit to a 'Global Partnership for Sustainable Development'.

With this recognition of the need for more equitable global governance, how did African actors influence the negotiations over what

would become the UN 2030 Agenda, generally, and SDG 16, specifically? The first task was gaining representation: despite the ongoing global structural inequalities, a number of African individuals and representatives played prominent roles in the negotiation of the 2030 Agenda during 2012–15 and promoting it since. In particular, former Nigerian environment minister Amina Mohammed was appointed as the UN Secretary-General's Special Advisor on the Post-2015 Development Agenda (and subsequently as UN Deputy Secretary-General in 2017), while Liberian President Ellen Johnson Sirleaf was Co-Chair of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (2012–13), a panel which also featured African members from Benin, Kenya, Nigeria and South Africa. In addition, Kenya's UN ambassador, Macharia Kamau, was both Co-Chair of the Open Working Group on the Sustainable Development Goals (OWG, 2012–2014) and later Co-Facilitator of the 2030 Agenda inter-governmental negotiations (2014–2015). The African Group in the OWG held seven out of the Group's 30 seats, while South Africa played a prominent leadership role in the G77 bloc during negotiations (Dodds et al. 2017). These were influential positions occupied by Africans.

Furthermore, African influence in the process of negotiating the SDGs was supported by the AU coordinating the development and promotion of the CAP on the Post-2015 Development Agenda. The CAP, mandated in July 2012, included the creation of a High-Level Committee (HLC) to lead the regional process. The HLC was chaired by President Sirleaf of Liberia, who also Co-Chaired the UN High-Level Panel of Eminent Persons (see above), meaning that there was a substantial degree of cross-pollination in the respective regional-global processes. The Africa Regional Consultation on the SDGs held in Addis Ababa in 2013 fed into the development of the CAP. The CAP highlighted consultations with a wider range of African stakeholders than during the MDGs (AU 2014, p. 2). The CAP 'identifies substantive issues of importance to Africa and arrives at a consensus on Africa's key priorities, concerns and strategies to be reflected in the outcomes of the post-2015 negotiation process' (AU 2014, p. 3), and indicates that African governments were committing themselves to act in unity and collectively to ensure integration of an African voice in the global development agenda (AU 2014, p. 3). Moreover, the CAP highlighted the desire for regional ownership of the process (AU 2014, pp. 4–5).

The CAP identified six 'pillars' that structured Africa's development priorities in the negotiations: (i) structural economic transformation and inclusive growth; (ii) science, technology and innovation; (iii) people-centred development; (iv) environmental sustainability, natural resources management and disaster risk management; (v) peace and security; and (vi) finance and partnerships. While 'governance' is not directly listed one of the six priority pillars, a number of governance themes are highlighted. For example, under Pillar One, the pursuit of structural economic transformation requires that 'governance at the international level should be more responsive, legitimate, democratic and inclusive by strengthening the voice and participation of African countries' (AU 2014, p. 5); Pillar Six demands that the 'global governance architecture is inclusive, responsive, legitimate, democratic, equitable and accountable' (AU 2014, p. 16). The CAP also positions governance in relation to 'addressing the root causes of conflict', requiring relevant actors to address socio-economic inequalities, strengthen good and inclusive governance and to combat discrimination (AU 2014, p. 14). Moreover, the concluding section of the CAP—'enabling implementation'—is defined by commitments to reform both continental and global governance processes and structures, including among others to: sustain democratisation and build resilience; fight corruption and promote good governance; enhance the implementation and impact of existing continental mechanisms; ensure an 'effective global governance architecture' that includes equitable representation of Africa in global institutions; and ensure equality and justice for all.

Following the CAP, the UN Economic Commission for Africa report on African

regional SDGs consultations (UNECA 2015, p. 35) proposed 12 SDGs. Of these, Goal 12 is to 'promote good governance at national and international levels', and its two targets entail 'good governance, transparency and accountability' (12a) and 'peace, security and socio-political stability' (12b). Goal 12a includes reinforcement of democratic processes and elections, zero tolerance to undemocratic change in government, cutting corruption by 20% by 2020, and 80% by 2030, accession to the APRM by all African states by 2020 and strengthening of African voice in global financial institutions by 2025. Goal 12b entails reduction of armed conflicts to zero by 2020 and by 2030 achieve violent conflict-free society and enhanced contributions to the African Special Fund for Peace and Security.

We draw two key conclusions from this overview of how Africa has sought to situate governance within the sustainable development agenda. First, African states link governance reforms at the national, continental and global levels. Democratic reforms of global governance institutions are considered as necessary as democratisation at national levels. Second, governance reform is positioned as an enabler of development, in addition to being a goal itself. Governance reform is a specific means to prevent conflict, and poor governance practices are a structural condition undermining other aspects of the wider development agenda. As Wachira (2017, p. 5) suggests, democratic governance and peace and security are interrelated, interdependent and mutually reinforcing essentials for sustainable development and continental integration. Thus, it is useful to frame governance and security as sustainable development issues.

Following three years of intensive negotiations, drawing upon global input from governmental and non-governmental stakeholders, including from Africa, the 17 SDGs were agreed in September 2015 as part of the 2030 Agenda (UN 2015; Dodds et al. 2017). SDG 16, identified in in shorthand as 'Peace, justice and strong institutions', is to 'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels' and includes targets such as reduction of violence, promotion of the rule of law, reduction of corruption, effective and accountable institutions and the increase in participation of developing nations in global governance.

Importantly, SDG 16 was one of the most controversial aspects of the critical negotiations on delineating the goals in the Open Working Group during 2012–14, such that with 'strong views being expressed on all sides of this debate, considerable opposition to Goal 16 remained until the last hours of the OWG…[u]ltimately, despite the many difficulties, agreement was reached on Goal 16, possibly the most sensitive and controversial of all' (Dodds et al. 2017, p. 40). Countries including China, Russia, India and Brazil were largely opposed to the inclusion of 'security' issues and targets in the new global development agenda, citing a range of objections ranging from fears about the securitisation of development, to sensitivities around reporting on internal violence, to the challenges of measuring progress, to claims that security and development should remain de-coupled in concept and practice (see Saferworld 2014; Bellamy 2015). Nevertheless, the counter-argument linking peace, security, governance and development—an approach strongly supported by the CAP—won the day, resulting in the inclusion of Goal 16 in the final SGDs (albeit in a less robust form than in the CAP and existing AU instruments). Indeed, Africa argued that governance and security are measurable and proposed indicators drawn from the work of African Peer Review Mechanism (APRM) for measuring SDG 16 at the national level (Bolaji-Adio 2015, p. 16).

This provides some evidence of African agency influencing the global negotiations. It highlights the assertion of an African voice in the growing international consensus that governance and security are interrelated and crucial for sustainable development. There are clear overlaps between Agenda 2063, the CAP and SDG 16, partly as a result of effective collective African advocacy. Indeed, in January 2016 the AU Assembly stated that it 'welcomes the adoption' of the 2030 Agenda and related Addis Ababa

Action Agenda on Financing for Development, 'which significantly captures Africa's priority areas and are compatible with Agenda 2063' (AU 2016).

5.3 The African Governance Architecture: Implementing SDG 16 in Africa?

African actors, allied with others, succeeded in having SDG 16 included in the 2030 Agenda. Going beyond this important step, we now examine what this means for the implementation of SDG 16 and governance reforms in individual countries and societies in Africa. To answer this question, we need to examine the nature and role of the African Governance Architecture (AGA).

As part of this desire to take greater ownership of continental affairs, the AU mandated AGA in 2011 to complement its existing African Peace and Security Architecture (APSA), which had focused more on the management of existing conflicts than on conflict prevention. The AGA, formally established in 2012, is the AU's overall political and institutional framework for defining, promoting and regulating its continental democratic governance agenda (Wachira 2015; AU 2017). Through its African Governance Platform (AGP), it is also a mechanism for engaging a wide range of stakeholders in that agenda, which is itself in turn part of a more inclusive and democratic set of consultative and participatory governance processes emerging on the continent. Taking and demonstrating 'ownership' of this continental governance agenda is important for the AU because, first, the OAU's non-interference approach rendered it impotent in dealing with internal governance crises, such as military coups, rigged elections or major human rights abuses, and second, because the 'good governance' agenda in the 1990s was partly driven by, and came to be associated with, external donors' demands for democratic governance in exchange for aid (see Abrahamsen 2000).

The AU has subsequently sought to legitimate and demonstrate ownership of AGA on the basis that it reflects African 'Shared Values' on governance. These values are derived from existing African inter-governmental agreements and instruments pertaining to governance themes that emerged in the 1980s and proliferated as more explicitly regulatory governance instruments following the transition to the AU. Summaries of such 'shared values' can be found in the AU Commission's *Strategic Plan 2009–12*, in the 2011 AU Declaration on Shared Values, and in the AGA Framework. Mirroring relevant aspects of Agenda 2063 and the CAP cited above, these values include clear support for popular political participation, democratisation and political pluralism, free and fair elections, respect for human rights, respect for constitutionalism and the rule of law, anti-corruption, transitional justice, gender equality and youth empowerment. Complimenting APSA, reform and implementation in these governance areas is asserted to be a key means of structural conflict prevention in Africa. In drawing on existing agreements and shared values, and despite technical, human and financial challenges, the AGA has attempted to communicate these values in a new and more coherent form to promote compliance and reform.

Housed by a Secretariat in the AU Commission Department of Political Affairs (DPA,) AGA is managed by a tripartite Bureau (currently comprised of APRM, ECOWAS and DPA as Secretariat) and substantively focuses on five thematic work clusters: democracy, governance, constitutionalism and rule of law, human rights (including transitional justice), and humanitarianism. AGA's institutional framework, the AGP, is designed to coordinate existing AU bodies and RECs that have a mandate for democratic governance, including, among others, AU Peace and Security Council, AU Commission, African Commission and Court on Human and People's Rights, Pan-African Parliament, APRM, Conflict Early Warning System, AU Economic, Social and Cultural Council, and eight Regional Economic Communities (RECs).

Stakeholders are conceived as two concentric circles, with AU bodies and RECs in the first or inner circle and other stakeholders, including

African citizens, civil society, the private sector and international partners, in the second, outer circle (Wachira 2015). As Wachira (2017, p. 9) states, among a number of key objectives, the AGA seeks to address two key deficits, namely: the reluctance of African states to internalise norms that they have sanctioned, and the limited coherence and cooperation of AU organs, institutions and RECs in implementation of AU Shared Values within Member States. For instance, although in many African states there is a normative conception of good governance and increased participation of citizens, this has often not translated into real improvements in governance.

Through its objectives and mechanisms, the AGA is subsequently positioned to be the key mechanism for facilitating the implementation of the African democratic governance (and structural conflict prevention) agenda. The close alignment between AGA's mandate and SDG 16 and the move for African ownership of the global development agenda makes the AGA well-positioned (on paper) to facilitate the implementation of SDG 16 in Africa. As Corrigan and Gruzd (2017, p. 7) argue, the progress of SDGs and Agenda 2063 needs monitoring and analysis of measures taken to achieve them. This is critical because despite progressive norm-setting in Africa, norm-diffusion, norm-implementation, supervision and monitoring face significant challenges (Wachira 2017, p. 8). We conclude by highlighting the key opportunities and critical challenges facing AGA in performing this implementation role.

5.3.1 Implementing SDG 16 in Africa: Key Opportunities for AGA

First, because it is mandated to play a continental coordinating role on governance, AGA can leverage capacities of Platform institutions to coordinate and identify best practices in Africa which would, in turn, be useful in harmonising approaches to implementing SDG 16 and Agenda 2063. Second, because it is mandated to popularise governance reform and to facilitate normative change and democratic governance at AU, RECs and country levels, AGA can stimulate popular demands for governments to implement Agenda 2063 and SDG 16 using mechanisms such as Democratic Governance (DG) Trends debates and High-Level Dialogues with citizens and civil society. Third, because of its role in reporting on implementation of governance agreements, including a mandate to oversee the State Reporting process for the African Charter on Democracy, Elections and Governance (ACDEG), monitoring the SDG 16 targets could potentially be added to AGA's reporting responsibilities (with a clear mandate and funding). The Secretariat could rely on APRM's contribution to unpack country-specific factors affecting implementation of SDG 16. AGA could also promote the adoption of qualitative tools and a 'common but differentiated responsibility' approach to the development of indicators to measure SDG 16 in Africa. Finally, AGA can build synergy with APSA through dialogue and common initiatives on security and governance considering that CEWS and PSC belong to both architectures. AGA could support APSA by outlining country- or region-specific governance problems that might affect peace and security. This is instrumental to the realisation of both Agenda 2063 and SDG 16.

5.3.2 Implementing SDG 16 in Africa: Key Challenges for AGA

First, implementation of both Agenda 2063 and SDG 16 face significant challenges considering the disparity between norm-setting and norm-implementation by African governments. In light of their inconsistent political will and concerns to defend state sovereignty, AGA can only effectively support implementation of Agenda 2063 and SDG 16 to the extent that states allow it to encroach on otherwise sensitive 'domestic' matters relating to governance and security. Second, there remain problems of institutional consolidation. The AGA has a weak legal basis in the AU system, which undermines its standing and capacity. The lack of synergy and coherent coordination among Platform members and

capacity constraints (human, technical, and financial) undermine AGA's ability to effectively execute its mandate. The ongoing AU reform process led by Rwandan president and AU Chairperson Paul Kagame presents an opportunity to consolidate and enhance AGA's capacity and functionality within the AU system, which in turn will be crucial for the implementation of Agenda 2063 and SDG 16. Finally, problems of political legitimacy and ownership remain. AGA's claims to 'agency' and 'ownership' are undermined because the AU still obtains substantial financial support from external donors. The AU's plan to increase the contribution by its Member States through a 0.2% levy on imports can help AGA gain more legitimacy to facilitate implementation of Agenda 2063 and SDG 16. In addition, funds from the UN system and other stakeholders to support implementation of SDG 16 can be channelled to AGA through the AU.

5.4 Conclusion

Following the extensive criticism of the lack of robust stakeholder engagement in the development of the MDGs, there was a deliberate effort to improve consultations in the development of Agenda 2030. Importantly, the development of Agenda 2030 took place at a time when pan-African agency and the African Renaissance were gaining momentum. The AU sought to take a more proactive and interventionist approach to governance of the continent and demanded a stronger collective voice in negotiating the global governance agenda: the development of UN 2030 Agenda and AU Agenda 2063 coincided. As such, the formulation of the CAP was an important mechanism for bringing these agendas closer together from an African perspective. In doing so, the AU argued that linking governance reforms at national, continental and international levels was critical to equitable and sustainable development. In addition, the AU argued for the linking of governance, security and development. The adoption of SDG 16 as part of the 2030 Agenda provides some evidence of African agency in this process. AGA is a viable institutional mechanism for the implementation of SDG 16 and key aspects of Agenda 2063 on the continent, but some important obstacles need to be overcome. AGA must seek greater financial independence and build institutional synergies within the AU system and with civil society to effectively facilitate and monitor implementation of SDG 16.

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African Mining and the SDGs: From Vision to Reality

6

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Abstract

Prior to the adoption of the sustainable development goals (SDGs), the African Mining Vision set out a roadmap for mineral development to drive human development across the region. The vision was based on an assumption that under the right policy and regulatory regimes, mining could contribute to development by delivering significant revenues and economic linkages. This assumption has been tested in relation to the SDGs at a global level in the report on *Mining and the SDGs: A preliminary atlas*. The report is a joint effort of the United Nations Development Programme, the World Economic Forum, the Columbia Center on Sustainable Investment and the Sustainable Development Solutions Network. This chapter focuses on the potential contribution of the mining industry to the attainment of the SDGs in Africa. The potential contribution of both large-scale formal mining and artisanal and small-scale mining to sustainable development is considered. We find that while some of the major global mining companies are able to show a contribution to the SDGs through specific projects in Africa, it is more challenging to implement, scale-up and measure the impact of the SDGs' framework for the industry as a whole.

Keywords

Mining · Minerals and sustainable development · Ghana

6.1 Introduction

Africa is richly endowed with mineral resources with over 30% of the world's global mineral reserves and production of over 60 different metals (United Nations Economic Commission for Africa 2011). The continent boasts a majority of the world's known resources of platinum, gold, diamonds, chromite, manganese and vanadium as well as a large share of the world's bauxite, cobalt, gold, phosphate and uranium deposits. In addition to large-scale mining, there is a long history of artisanal and small-scale gold mining dating as far back as the fifteenth century

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(Tetteh 2010). The mining industry has the potential to be an economic driver and contributor to poverty alleviation through job creation, infrastructure development and payments to the national purse. However, there are concerns that mining investments have not always translated into inclusive, sustainable socio-economic development. Studies report that resource-endowed countries score lower on human development indices and have greater wealth inequalities (Dobbs et al. 2013).

In response to this, African heads of states adopted the African Mining Vision (AMV) in 2009 to advocate for 'transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development' (African Union 2009). The vision aims to harness the sector for sustainable development, wealth creation and linkages to Africa's social and economic development process. The principles of the AMV align with the United Nations 2030 Agenda and the SDGs' targets for all nations to reduce poverty and inequalities, enhance economic development and mitigate climate change. To meet these goals requires partnerships between governments, the private sector, development partners, civil society and communities. The AMV and SDGs focus on industrialisation, infrastructure development, climate action and areas where the mining industry can play a significant role. Mining has the potential to contribute to all 17 SDGs (Table 6.1) and, in doing so, support economic development and environmental sustainability (United Nations Development Programme (UNDP), Columbia Center on Sustainable Investment (CCSI), United Nations Sustainable Development Solutions Network (SDSN), World Economic Forum (WEF) 2016).

In this chapter, we discuss the mining sector's contribution to the realisation of the AMV and the attainment of the SDGs, providing examples of how large- and artisanal-scale mining can improve livelihoods through the creation of jobs, provision of medical care, diversity and inclusion, and entrepreneurship. We stress that, in principle, outlining mining contributions to SDGs can be relatively simple; however, in practice, the implementation, scale-up and measurement of impact is far more complex.

6.2 Mining in Africa and the Sustainable Development Goals

While the Millennium Development Goals (MDGs) focused on minimum needs, the SDGs not only continue global efforts to guarantee minimum needs (from SDGs 1–7) but also promote an inclusive, equitable and sustainable post-2015 global society (from SDGs 8 to SDGs 17). They integrate the three dimensions of sustainable development, namely, social, environmental and economic (People, Planet, Prosperity). The MDGs focused on global partnerships for development among states. The successful implementation of the SDGs, however, hinges on all stakeholders' taking responsibility for their achievement. The SDG framework, in particular, calls on the private sector to incorporate the SDGs into their practices and operations. Given the importance of the mining industry to mineral-rich African economies, the role of the private sector as a partner for implementing the SDGs in Africa will depend significantly on the contribution of the extractive industries.

The mining sector can be a springboard for development by bringing skills, capital, jobs and infrastructure, but can also have deleterious impacts on the country of operation by being a source of corruption, social degradation and environmental disturbance. These negative impacts can, in turn, frustrate the stability and, consequently, the profitability of the investment which is not in the interest of the sector. In this context, the SDG framework offers a shared language on development outcomes and measuring matrices that enable the alignment of the industry and individual companies' strategy with national and local priorities, creates opportunities for partnerships to catalyse shared investments for greater benefits and strengthens the engagement with local stakeholders.

To help the mining industry navigate where its activities—from exploration through production and mine closure—can contribute to the achievement of the SDGs, CCSI, WEF, SDSN and UNDP embarked on a study titled *Mapping mining to the Sustainable Development Goals: A preliminary atlas* (UNDP, CCSI, SDSN, WEF 2016). The atlas is meant to encourage mining companies of all sizes to incorporate relevant SDGs into their business and operations, contextualise and reframe current efforts and spark new ideas towards *a multi-stakeholder dialogue and collaboration* aimed at achieving the SDGs. The atlas found that the mining sector impacts all 17 SDGs in varying degrees, depending on the size of the company, the type of operations and the geography of impact. The mining impact can be positive, negative, direct or indirect. Despite this cross-cutting impact, it is noteworthy that some SDGs are particularly relevant for mining (UNDP, CCSI, SDSN, WEF 2016) (Table 6.1).

The focus of the atlas is mainly on large-scale mining; however, given the millions of people who engage in Artisanal and Small-Scale Mining (ASM), which far outstrips the number employed by large-scale mining, greater attention should be given to the positive and negative implications of ASM on the SDGs. As we will see in the last section of the chapter, in many African countries, ASM is an important economic activity and livelihood strategy for people in poor communities but, at the same time, ASM is associated

Table 6.1 SDGs relevant to mining (UNDP, CCSI, SDSN, WEF 2016)

SDG 1 (*Poverty) if the mining sector, in particular*:
•Pays fair and accurate share of taxes and royalties
•Promotes inclusive employment (direct and indirect)
•Builds local, national and regional procurement strategies, leveraging skills, expertise, innovation and technology to further stimulate growth and employment
•Plans early for land access, resettlement and livelihood restoration
SDG 6 (*Clean water and sanitation*) *if the mining sector, in particular*:
•Conserves and recycles clean water, including recycling, retreating and reusing
•Monitors water quality, using participatory monitoring processes, to address risks and improve transparency
•Adopts approaches to water access and quality that consider the social, cultural and technical aspects, to avoid conflict and build trust
SDG 7 (*Energy access and sustainability) if the mining sector, in particular*:
•Improves energy efficiency, including investment in R&D relating to new low-energy technology, reducing use, conducting energy audits, etc.
•Incorporates renewable energy (off-grid or mini-grid wind, solar or geothermal energy)
SDG 8 (*Decent work and economic growth) if the mining sector, in particular*:
•Drives economic growth with local procurement and supplier development strategies
•Establishes more inclusive recruitment, education and training
SDG 9 (*Infrastructure, innovation and industrialisation) if the mining sector, in particular*:
•Supports local procurement and skills development to support industrialisation and foster innovation
•Considers shared infrastructure solutions to improve access and create both economies of scope and scale
SDG 13 (*Climate change*), *if the mining sector, in particular*:
•Adopts a corporate policy, governance structure and processes to address climate change
•Reduces, measures and reports emissions
•Aligns company strategies with national efforts on climate change action
•Builds climate change resilience in the design and placement of operations and associated infrastructure
SDG 15 (*Life on land*), *if the mining sector, in particular*:
•Achieves net zero or net positive impact of critical habitats
•Implements biodiversity offsets
•Preserves ecosystem services, based on comprehensive baseline assessments
SDG 16 (*Peace, justice and strong institutions*), *if the mining sector, in particular*:
•Prevents company—community conflict, through engagement, grievance mechanisms, conflict assessments, etc.
•Implements human rights impact assessments
•Respects Free Prior and Informed Consent and special status of indigenous peoples (extend to all affected communities)
•Participates in conflict-free minerals certification schemes and support implementing relevant regulations

with many negative social, environmental and health impacts as well as armed conflict and human rights abuses. If effectively managed and regulated in compliance with health, safety and environmental standards, ASM could contribute to SDG 1 (End poverty), SDG 3 (Good health and well-being), SDG 8 (Decent work and economic growth), SDG 15 (Life on land) and SDG 16 (Peace and justice; strong institutions).

While it is relatively easy to conceptualise the contribution to and the impact on SDGs from mining, operationalising the SDGs at company level and country level is fraught with challenges. A round table organised by CCSI and partners on 21 September 2017 revealed several roadblocks with the integration of SDGs as a guiding framework to optimise the mining footprint in resource-rich areas (CCSI 2017). Governments have not yet put the reporting framework on the SDGs in place, nor have they built domestic consensus around the use of SDGs as a planning framework. Few people are familiar with the SDG framework at local level, whether local government, local NGOs or local communities, even though local stakeholders *are* interested in what the SDGs are intended to achieve.

Many companies still need to translate sustainability into their core business strategies or operation. Companies' primary business metrics, key performance indicators and incentives focus predominantly on production and cost. They therefore neglect the sustainability of business through social development. Many companies are now mapping existing business activities to the SDGs but the exercise stops at this level with no significant change to drive greater levels of industry contribution to the SDGs.

Innovative investors and business models should target long-term value creation, corporate governance that has societal impact, and that is also aligned to national and regional needs and aspirations. These steps would rely on the sharing of data that is at the core of the SDG undertaking. Companies, governments and perhaps local universities have different datasets that are not shared, which makes the establishment of a baseline and tracking of progress difficult.

In this context, there is still a long way to go for the SDGs to be used as a shared language to optimise development outcomes at the country level but at least the conversation has started. Tools such as the mining atlas or the SDG compass are already available to support this undertaking.[1] It is possible that the mining sector will move faster than the host governments on integrating the SDGs into their vision and strategy. Consequently, it is hoped that companies will take the lead in helping governments create processes around leveraging SDGs for their planning framework (Fig. 6.1).

6.3 The Contribution of Large-Scale Mining to the SDGs: Case Studies

The large-scale multinational mining companies, known as the 'majors', have played a leading role in defining the parameters of environmental and social sustainability performance in the sector since the Global Mining Initiative (GMI) began in the late 1990s. The GMI commissioned an independent, 2-year stakeholder consultation process on Mining, Minerals and Sustainable Development (MMSD). An industry association known as the International Council on Mining and Metals (ICMM) was born out of this initiative in 2001. The organisation has 27 members, including seven of the top ten largest listed mining companies in 2018: BHP, Rio Tinto, Glencore, Vale, Barrick Gold, Barrick and Newmont (Benton 2018). Most of their members operated in Africa during and after the mining boom, which peaked during the first decade of the twenty-first century.

The ICMM has played an important role in developing principles and guidelines to address well-known environmental and social risks and adverse impacts of the mining industry. In line with the United Nations Guiding Principles on Business and Human Rights, the ICMM advises its members and the industry more widely to

[1]Refer to: UNDP, CCSI, SDSN, WEF 2016 and SDG compass: https://sdgcompass.org/

Fig. 6.1 Major areas where mining and each SDG intersect (UNDP, CCSI, SDSN, WEF 2016)

'first do no harm' when mining activities threaten, for example, the livelihoods or stability of host communities, biodiversity, water or air quality. Due diligence of the potentially negative impacts of mining on the SDGs is encouraged in sustainability reporting, for example, using the 'SDG Compass' of the Global Reporting Initiative (GRI).

Since the launch of the SDGs in 2015, the ICMM has also published guidance online on mining and the SDGs, and has begun to profile positive case studies from their member companies. The purpose of the case studies is 'to highlight how companies are working to enhance their contribution to society and help industry to manage potential adverse impacts their activities may have on the realisation of some of the SDGs' (ICMM 2017). Seven of the case studies focus on African countries and address the topics outlined in Table 6.2.

The seven cases address four aspects of the SDGs, namely, local governance, job creation, health and gender inclusivity. These are all socio-economic rather than environmental goals,

Table 6.2 ICMM case studies relating to the SDGs in Africa (ICMM website: https://www.icmm.com/en-gb/library#)

Company	Topic	Country	SDGs referenced
Anglo-American	Strengthening local government capacity	South Africa	SDGs 1, 9, 11, 16 & 17
Anglo-American	Corporate leadership on HIV/AIDS	South Africa	SDG 3
Anglo De Beers Group	Promoting economic diversification and local entrepreneurship	Botswana	SDGs 1, 8 & 17
AngloGold Ashanti	Combined workforce and community malaria control programme	Ghana	SDG 3, 17
Glencore	Incubating local businesses	South Africa	SDG 8
Minerals and Metals Group	Promoting gender inclusivity in mining	DRC	SDG 5
Newmont	Strengthening governance and contributing to regional development	Ghana	SDGs 16 & 17

although the ICMM case studies in other parts of the world include initiatives related to biodiversity, water and land management, climate action and energy projects. The two health-related case studies are good examples of how private investment can share value with the mining workforce and local communities in the specific case of the control of the HIV/AIDS and malaria pandemics. They differ in the scale of the initiatives, with the AngloGold Ashanti case focused on the Obuasi mine and surrounding communities and the Anglo-American case providing free Anti-Retroviral Treatment (ART) to all employees since 2002. Although the Obuasi mine is a single-site-level example of mining providing a community health benefit, it is typical of similar initiatives in malarial zones of Africa (Perry 2011). The remote location of mining projects and the nature of the mosquito-borne disease draw attention to the need to spray and eradicate malaria in previously unreached areas to protect the workforce and local communities at the same time.

The enterprise development cases illustrate one of the most common approaches by mining companies to social investment, namely, local procurement and small business incubation projects. The case from Botswana refers to the Tokofala (meaning 'to improve' in the local Tswana language) initiative. It is a partnership between Anglo-American, De Beers, Debswana and the government of Botswana offering business mentorship and skills training. The programme was modelled on the successful Anglo-Zimele initiative in South Africa and there are parallel projects in Latin America. Glencore's local enterprise development project is on a smaller scale and takes place in the South African context of mandatory local employment and Broad-Based Black Economic Empowerment (BBBEE). Nevertheless, the company states that 'Glencore's efforts go beyond what is required by law and aims for continuous improvement' (ICMM 2017).

The two cases of mining companies contributing to the strengthening of local governance also differ in their geographical reach and form of engagement with stakeholders. The Anglo-American case addresses a key political and socio-economic challenge in post-apartheid South Africa, which is the weakness of many local government institutions and their ineffectiveness in the delivery of basic services. The approach is to strengthen the capacity of 11 municipalities in a partnership led by the Development Bank of Southern Africa (DBSA) and through the Investment Climate Facility for Africa.

The Newmont case focuses on its social investment model through the Ahafo Development Foundation. The case is interesting in that

the company acknowledges the risk that 'companies can sometimes stray too far into government territory' when rolling out community development projects in remote areas (ICMM n.d., p. 1). The participatory approach of the fund includes 6 government representatives, 24 representatives of traditional authorities, 20 elected community representatives and 2 staff members of Newmont Ghana Gold Limited (ICMM 2017).

The case study on gender inclusivity in the Democratic Republic of Congo (DRC) relates to an opportunity for MMG to influence a review of Congolese labour law to lift a ban on night shifts by women working in the industry. The Order No 68/13 of 1968 (Conditions of work for women and children) was based on the ILO Night Work (Women) Convention 89 of 1948, which has now also changed to allow women to work night shifts. While the opportunity for the Kinsevere mine management to support law reform in the DRC was fairly unique, the resulting change in work culture around women in mining provides a positive example to other mines in the African context.

The brief review of the abovementioned case studies shows that they each describe existing initiatives of the member companies, which began before the United Nations SDGs were launched in 2015. The challenge then becomes for these and other companies to ramp up their initiatives in the future to achieve significant changes and a more meaningful contribution to the SDGs. The ICMM case studies suggest that partnership with governments and other stakeholders is one of the ways to amplify the reach and positive impact of initiatives, which concurs with the spirit of the SDGs in general and SDG17 in particular.

The case studies provide examples to other mining companies of what types of activities and policies they could emulate to support positive impacts on the environment, local communities and the broader societies in which they operate. While the broad initiatives of some of the multinational majors are impressive, the single-site cases could have an even more significant impact if replicated by the hundreds of mid-tier and junior mining companies operating across Africa.

6.4 Artisanal and Small-Scale Mining Contribution to SDGs

Artisanal and Small-Scale Mining (ASM) represents a spectrum of mining activities ranging from panning of precious metals (such as gold, diamonds and other gemstones) or quarrying of industrial minerals (such as limestones, clay and rock aggregates) using crude and unsophisticated methods to relatively large and organised operations. Estimates of the number of artisanal miners globally vary from 100 million (World Bank 2013) to 25 million (Hruschka and Echavarria 2011). It is estimated that ASM operators produce 10.6 million ounces of gold annually in 70 countries, US$9.6 billion per annum at 900$/oz and US$5.3 billion per annum at $500/oz. An annual income of US$1,000 per miner is estimated—albeit unevenly distributed (Telmer 2008). Figure 6.2 shows the number of artisanal small-scale miners per country in Africa.

Although there is no consensus on the definition of ASM and how many persons it employs and directly impacts, there is widespread agreement that ASM, given its low level of mechanisation, engages more people than large-scale mining and, by virtue of this, can have far-reaching implications for livelihoods and sustainable development. ASM is expected to contribute to growth and sustainable development of local communities and underpin national economic growth in line with the AMV. One of the pillars of the AMV is harnessing the potential of small-scale mining to improve rural livelihoods by stimulating local and national entrepreneurship, and integration into the rural and national economies. ASM is therefore seen as a development tool for achieving these goals.

Given the historical context of artisanal gold mining in Ghana which contributed largely to the rise and fall of kingdoms and the development of the communities and the growth of local economies, Ghana provides a useful context in which to evaluate ASM impact on livelihoods and sustainable development. Artisanal mining in Ghana was done alongside large-scale mining in the colonial era until colonial laws placed minerals under the colonial government for easy

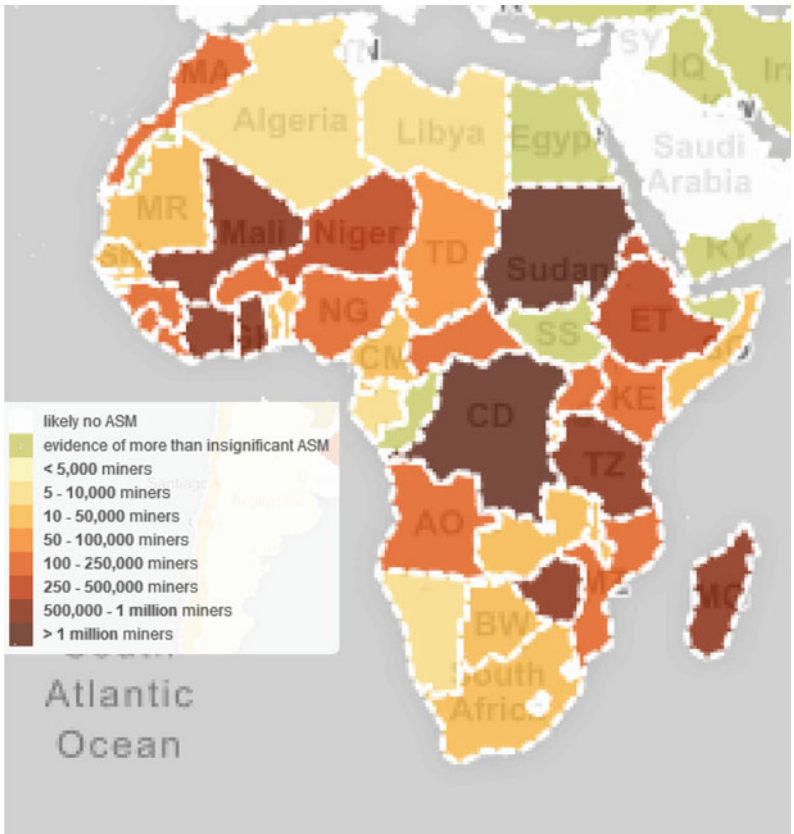

Fig. 6.2 Estimated number of artisanal and small-scale miners per country in Africa (Artisinalmining Online 2018)

regulation and governance. In the late 1980s, when Ghana adopted the Economic Recovery Programme (ERP), the mining sector was revitalised and a new mining law, Act 703, was passed and this paved the way for the Small-Scale Gold Mining Law 1989 (Provisional National Defence Council Law 1989). The Small-Scale Mining Law 1989 as repealed by the Minerals and Mining Act 703, defined Small-Scale Gold Mining as 'the mining of gold by any method not involving substantial expenditure by an individual or group of persons not exceeding nine in number or by a co-operative made up of ten or more persons' (Provisional National Defence Council Law 1989 Page VII–1056). The law went further to indicate the size of concession (5–25 acres) that small-scale miners are entitled to and that Ghanaian nationals are to be engaged in small-scale mining.

The main aim of legalising small-scale mining was to provide employment in rural areas, increase gold output, maximise the country's foreign exchange earnings and leverage small-scale mining as a catalyst for accelerated development of mining communities and sustainable national development. These goals are expected to contribute towards the achievement of the SDGs. However, with the legalisation of ASM, there was a mass infiltration of illegal mining in Ghana called *galamsey*. Hilson and Potter (cited in Aubynn et al. 2010) attribute this to the long-winded registration process which is a major disincentive for ASM formalisation. This situation is aggravated by the lack of knowledge about the mineralisation of lands licensed to the ASM operators who consider the 'hassle' of registration a futile exercise. It is estimated that less than 30% of the over 250,000 ASM operators in the country are duly registered and licensed (Aubynn et al. 2010). Effectively, therefore, when one talks about ASM in Ghana one is referring largely to the illicit *galamsey* operators.

In Ghana, it is estimated that between 100,000 and 250,000 people are directly engaged in ASM, of whom some 30% are women. Since 1989, the gold and diamond production from the ASM sector has generated over US$500 million (Aubynn et al. 2010). Since 1990, Ghana has produced an average of 1 million ounces of gold and 800,000 carats of diamonds per annum. In 2008, the country recorded gold production of over 2.2 million ounces and approximately 598,000 carats of diamonds. Of these, an average of about 150,000 oz (about 10%) and 700,000 carats (about 70%) of gold and diamonds, respectively, is estimated to have been produced by the ASM miners (Aubynn et al. 2010) with ASM contribution increasing to 31% (1.65 million oz) of total gold production in 2016 (Aubynn 2017).

A study by Francis et al. (2016) explored the nexus between livelihood and ASM in the Prestea mining region in Ghana. They surveyed 151 ASM miners and farmers. They identified three drivers for artisanal mining, namely, a quick way to generate a high income, limited job opportunities and low earnings from farming. They found that ASM created direct employment opportunities for people, particularly those who had not attained a high level of education. They worked as diggers, transporters, security, processors and head porters. Indirect employment opportunities include working as water sellers, food vendors, taxi drivers, goldsmiths and traders, among others. This resonates with other studies on ASM-related local economies (McQuilken and Hilson 2016). With this income, families are able to meet their basic household needs such as food, shelter, education and medical care. However, miners are vulnerable to fluctuations in commodity prices, accidents and injury, and weather conditions in the rainy season. The authors of the Prestea study observed that ASM leads to the destruction of fertile farm lands and forestry, contamination of water bodies with mercury and child labour.

Just like Francis et al. (2016) and other researchers (e.g. Aubynn et al. 2010), the AMV country guidebook (Africa Minerals Development Centre 2014) recognises that, despite its contribution to mineral production, economic growth and employment, the following are challenges that prevent ASM from reaching its full developmental potential towards the SDGs: inadequate policy and regulatory frameworks; the limited technical capacity of miners; inadequately explored mineral-bearing areas; lack of access to finance and appropriate technologies; environment, health, safety, security and child labour issues.

The combination of these challenges, coupled with weak linkages between regulatory institutions and law enforcement agencies, tends to undermine the development potential of ASM. Of particular concern is the uncontrolled use of mercury for gold extraction that has resulted in massive pollution of mining environments. ASM operators discharge mining waste into wetlands, rivers, streams, valleys and water bodies, thereby causing pollution of these waters and contaminating aquatic life. Hilson (2014), referring to local and international media sources, pointed out that the entry of Chinese miners and financiers into Ghana led to the introduction of heavy machinery in small-scale gold mining in Ghana. This in turn has led to increased environmental degradation, destruction of ecosystems, farms and heightened vices such as theft and robbery, prostitution, child labour, murder and cross-border criminal activities. On 5 April 2017, the media coalition against galamsey was formed. The practice of ASM in its current form, especially in Ghana will erode any gains made through increased gold production and will make the achievement of the SDGs through ASM a mirage. At the time of writing, i.e. October 2018, the government of Ghana had placed a ban on ASM and had also set up a task force to arrest and prosecute any person caught engaging in any form of small-scale mining.

6.5 Conclusion

The importance of mining in an increasing number of African countries in recent years positions the extractive industries at the centre of

private sector initiatives in support of the SDGs. The examples from the ICMM illustrate mining's potential contribution to job creation, health care, entrepreneurship, gender diversity and inclusion and improved governance. ASM is an important and valuable livelihood strategy for a number of poor communities. The SDGs provide a common framework for LSM and ASM to map, plan, implement and measure their contribution to sustainable development. As outlined in this chapter, this is fraught with challenges—the absence of national SDG plans, poor awareness of the SDGs by local stakeholders, business models and operations that fail to holistically incorporate SDGs, and barriers to a collective approach to gather data to track progress. However, if the efforts of exemplary mining companies can be amplified across sites and other operators, and the regulatory and safety conditions of artisanal mining can be improved, this significantly can catalyse the attainment of the SDGs.

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7 Minding the Gap? The Media and the Realisation of SDG 13 in Kenya

Jacinta Mwende Maweu and Chris Paterson

Abstract

The media in Africa have a role to play in the attainment of Sustainable Development Goals (SDGs) by building awareness, setting the public agenda, and influencing and holding to account political leaders. In this chapter, we examine the problematic context of a commercialised and privatised media system playing a significant role in debates about development and in development education and advocacy—topics which are not necessarily profitable. Media can play a role as public information channels, engagement platforms, watchdogs and advocates for policy improvement—all crucial to the successful implementation of the SDGs—but media do not necessarily fulfil these obligations. With advances in technology, the power of the media to open new opportunities to drive social change and to transform development in Africa is unsurpassed. We explore how the contemporary political economy of Kenyan media challenges or supports such objectives. We also examine how information gaps concerning SDG goals, such as climate information in rural communities, pose a challenge to the realisation of the SDGs. We conduct an investigation into the form of analysis of media coverage of climate change and action in Kenya, but draw primarily from existing research concerning Kenyan media. Our findings show that the Kenyan media are ill-equipped to specifically support SDG 13 on climate change and action in the country.

Keywords

Kenya · Media · Climate change · Sustainable development

7.1 Introduction: Media and SDGs

In this chapter, we bring media into conversation with SDGs by using Kenyan media as a case study. Our focus is on how a commercialised and privatised media system plays a role in debates about sustainable development, especially climate change. Examining the role of the media in these debates is crucial because the media serve as a public information channel but also as a platform on which the public engage in debates. Technology has not only advanced the power of the media but has also enabled the media to contribute to social change and development. This raises the question of whether the Kenyan media plays such a role under conditions that are discussed below. To grapple with this question,

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we begin by examining how political and economic pressures may impair the media's capacity to focus on the plight of the poor with regard to climate change information and then address the extent of information deficits in rural Kenya. Finally, we look at Information and Communication Technology (ICT) and their potential role in the promotion of SDGs in Kenya.

Effective information and communication processes that allow people, especially those who are the most marginalised, to be their own agents of change are prerequisites for sustainable development and the success of the SDGs (British Broadcasting Corporation (BBC) World Service Trust 2010). Independent media play an essential role in delivering the information people need to participate in the debates and decisions that shape their lives. Increased access to information is particularly important for groups that are, or risk being marginalised such as people with disabilities, people living in rural areas, indigenous groups and others (UNESCO 2015). A diverse, dynamic and free media is therefore indispensable in achieving the SDGs.

In this chapter, we examine how the media can contribute to the attainment of the SDGs with a specific focus on SDG 13, which covers urgent action to combat climate change and its impact by building awareness, and setting the public agenda, influencing and holding to account political leaders. For most people in both the developed and developing world, rich and poor alike, the media are the primary providers of news and information on issues that directly affect their lives. Media coverage reflects and affects every aspect of cultural, social, political and economic life (Wilson and Warnock 2007). From a phenomenological perspective, the 'reality' each of us perceives (especially that with which we have little direct contact) is a social construction, and news media are of particular importance in shaping that reality (Debrett 2017). Mass media coverage can be a key contributor that can shape and affect, for example, the climate change policy discourse as well as public understanding and action. Over time, mass media representational practices have broadly affected translations between science and policy and have shaped perceptions of various issues of environment, climate change and action (Bacon 2011). The media have a key role in the development of public discourse on pressing global issues such as SDGs as well as enhancing a sense of global connectedness. In any democracy, the media should act as a civic forum, a mobilising agent and a watchdog, while also promoting behavioural changes by directing public attention towards specific policy concerns such as the SDGs (Norris 2001).

Both new and traditional media can play a fundamental role in communication processes that support relationships between citizens and government, and facilitate government responsiveness to all aspects of governance. Media offer a forum for debating policy options and strategies and for government to gain people's consent and trust. For Kenya and many African countries, mass media coverage can have a vital influence over climate change policy discourse as well as public understanding and action (Banda 2013). But our analysis of 20 prominent news stories on climate change-related issues such as famine, drought and food insecurity in Kenya's leading newspaper, the *Daily Nation* (on random dates between January and December 2017), shows that there is more focus on the situation as it is on the ground than on empowering the affected communities to increase their resilience and mitigation powers. In other words, climate reporting is typically problem—rather than solution oriented. The economic and political environments largely shape media reporting, an aspect to which we turn our focus in the next discussion.

7.2 Political Economy of the Media in Kenya

A political economy approach to media performance examines ownership and control of media and the nature of media activity to identify the extent of corporate reach, the commodification of media products and the changing nature of state and government intervention (Williams 2003). As McManus (1997) observes, in 'market-driven

journalism', there is an inherent conflict between the logics of 'maximizing returns' for the shareholders and 'maximizing public understanding'. We examine the extent to which this is the case in Kenya in regard to maximising public understanding on climate change and action through an analysis of media coverage of climate change. The media environment in Kenya is marked by largely private independently owned media enterprises, save for the quasi-public broadcaster, the Kenya Broadcasting Corporation (KBC). There is also a vibrant use of new media, especially mobile phones, among both the urban and rural population. Tunstall (2008) estimated that a typical African country experienced a tripling of population between 1950 and 2005 but saw the number of literate people increase by 80 times, daily press readers by 50 times and radio listeners by 200 times. So, despite the limitations of infrastructure, media and ICT use is increasing in Africa at an unparalleled rate, and patterns of information flow are shifting accordingly. As in most other countries in Africa, the media landscape in Kenya took on a new configuration in the 1990s with the increased cry for multiparty politics and the widespread liberalisation and privatisation of the media (Ali 2010; Ogola 2011). The 1990s saw independent television broadcasters on the continent increase from about 60 to more than 140 (Paterson 1998).

The number of radio stations increased from just a few in most countries to over 1000 (mainly commercial, FM) stations by 2000 (Tunstall 2008). It is these multiple media channels that ought to be tapped, especially radio, which is pre-eminent in rural areas and has the best chance of empowering rural audiences to understand and cope with climate change. Our interviews with journalists from three radio stations in some of the rural areas worst hit by climate change in the eastern and western parts of Kenya indicate that, as of 2017, there were no specific programmes on climate change. There were only general programmes related to agriculture. The journalists cited 'lack of expertise in that field' while county government officials argued 'that getting messages through the media is expensive' (Interviews, 18 February 2018).

As Murdock and Golding (1973) observed, private mass media are first and foremost commercial enterprises; it is reasonable to speculate that many of them are unlikely to prioritise climate change issues unless such reporting is deemed profitable in some way. Private commercial media can and do play key roles in society, such as surveillance of threats, informing the public, participating in public life as independent actors by way of critical comment, advice, advocacy and providing a channel and forum for public discussion (Wilkins and Christians 2009). But the performance of these roles is to a large extent influenced by the inherent economic constraints that govern the media as a commercial enterprise (Murdock and Golding 1973; Croteau and Hoynes 2006; Herman and Chomsky 2002). For most Kenyan media houses, science reporting is not a daily routine, partly because most reporters and editors do not understand it. Kenya is no exception in this—unlike politics, business and sport, science reporting is generally placed on the fringes of mainstream journalism (Science Africa Report 2011).

Generally, media coverage of climate change mitigation and adaptation takes place in the larger context of regulatory frameworks, political constraints and economic drivers. In the predominantly commercial media in Kenya, the core structural factors that influence the nature of media content can be said to include the overall pursuit of profit, the size of the firm, the amount of direct and indirect competition facing the firm and the nature of that competition, the degree of horizontal and vertical integration, the influence of advertising, the specific interests and political allegiances of media owners and managers and, to a lesser extent, media employees. It is these structural factors that determine the framing, frequency and emphasis on a particular news item, in this case climate change (Bolsen and Shapiro 2017). It is evident that there is very little coverage of climate change issues in Kenya media from what we gathered from rural

community media and our sample of the coverage in the *Daily Nation*. Focus on climate change issues only seems to surface when there is a major drought and famine. One would expect that, with all the visible effects of climate change, there would be consistent reporting to create awareness and increase public understanding, but this is not the case.

The main victim of the effects of climate change is the poor marginalised rural population; the same people who typically are not of significant interest to advertisers on the major national commercial media. The national broadcaster, KBC, which ideally should fill the gap left by the commercial media by playing its public service role of focusing on marginalised communities, has, however, also been caught up in the chase of advertisers, because of dwindling financial support from the government. For the media to provide high-quality public interest content, in which a wide range of voices is heard, liberalisation, pluralisation and regulation are all required. Fulfilment of the SDGs will also require recognition that communication is central to all aspects of sustainable development.

7.3 Climate Change Communication: Information Deficits/Access in Kenya

Climate change is a global phenomenon and all people are vulnerable to its impacts. But climate change poses greater danger to lives and livelihoods of poor people living in developing countries as is the case across Africa. It threatens to reverse many of the development gains that African nations have made by threatening food and water security, political and economic stability as well as livelihoods and landscape (Besada and Sewankambo 2009). The media and journalists as public informers, agenda setters, watchdogs, campaigners on social issues and public educators have critical roles to play in explaining the cause and effects of climate change, in describing what countries and communities can do to adapt to the impacts ahead, and in reporting on what governments and companies do, or do not do, to respond to these threats (UNESCO 2015).

To adequately adapt and mitigate the effects of climate change, both the countries and citizens in Africa need to have sufficient knowledge and understanding on climate change. The way the media covers climate change will affect how well societies in Africa deal with the problem. The more the media make climate change issues their agenda, the more governments will pay more attention and the more there will be more global focus and response to climate change in line with SDG 13. Despite the glaring adverse effects of climate change in Africa, millions of farmers are grappling with the changing climate around them but are starved of real, timely information on what their options are (Fellmann et al. 2018). Although the media are at the centre of promoting public understanding of climate change and action, there is very little academic research that has been done on the role of the media in climate change mitigation and adaptation in Africa.

The quantity of climate change coverage in African media is disproportionate to the level of threat it poses to the continent (Shanahan 2009). As BBC World Service Trust Report (2010) noted, African citizens are at humanity's climate change frontline, yet they are also among the least informed about human-induced global climate change, its causes and its consequences. The report further stated that broader public understanding of a range of climate change issues is required if Africa is to respond and adapt to climate change. Better public understanding will also be necessary to enable those most affected by climate change to communicate their perspectives and experiences to those most responsible for causing it. In this regard, there is also a need to address the imbalance in the flow of information on climate change from the rest of the world to Africa. To adequately address, adapt and mitigate the dangers and threats that Africa faces from the effects of climate change, there should be vigorous and sustained efforts from all stakeholders, consistent dialogue and a two-way flow of information that empowers African citizens, especially the most vulnerable to these effects in the rural areas. Research on public

understanding of climate change such as the BBC Media Action's Africa Talks Climate project (BBC World Trust Service 2010), as well as surveys of journalists, reveals that across Africa the media can and should do more to tell the story of climate change.

Effective communication mainly through the media is what turns a scientifically complex and epistemologically distant issue such as climate change into an issue of public concern (Driessen et al. 2010). First, through climate change communication the issue is positioned on the public and political agenda and also framed in particular ways (Dewulf et al. 2017). Through setting an agenda, the media can position the issue of climate change to compete for public attention amidst a broad range of other policy issues (Pralle 2009). The cycles of attention for an issue need to be considered, but also important is how an issue is framed through processes of strategic communication (Nisbet and Huge 2007; Holt and Barkemeyer 2012). Different framings aim to establish different meanings of the climate change issue, through employing different language and selectively emphasising certain aspects of the issue at the expense of others. This also affects decision preferences and public engagement (Nisbet 2009).

How the media presents an issue goes a long way to determine how the public sees the issue and how it reacts to it. Spirited communication efforts especially from the mainstream media over multiple decades have made climate change into what it has become in the early twenty-first century: an issue of prime importance for the future of humanity, inspiring global coordination, national policies and local initiatives (Dewulf et al. 2017). Information and public awareness campaigns are indispensable tools in making the general public understand the concept of climate change and to become aware of its importance (UNESCO 2015). Given the importance of media representations of climate change in influencing attitudes and behaviours, there is a growing body of literature which explores how visual images that highlight different aspects of climate change influence perceptions and decisions (Hart and Feldman 2016).

The vulnerability of individuals and communities to the impact of climate change varies greatly within countries as well as between and among different segments of the population within a particular country. In Kenya, the most vulnerable to the effects of climate change are the communities of urban poor living in informal settlements and the often marginalised rural poor, especially women and children, who are hardest hit when drought and floods occur.

The media, especially community and social media, can be used to empower these marginalised and vulnerable groups of people. This can be achieved through information that helps them to understand the local as well as global context of climate change to enhance their resilience and adaptive capacities. Empowerment for vulnerable groups means a population that is well informed and able to convert information into meaningful knowledge and expertise (UNESCO 2015).

Newspapers in Kenya and around Africa have long suffered from a lack of easy access to information from rural areas, and their mostly urban audiences have not demanded the necessary investment in far-flung newsgathering resources to provide that broad news coverage. Rural communities are at particular risk of information deficits because they are distanced from the complex and comprehensive flows of information that circulate in and near urban centres. A World Bank study in 1999 involving 40,000 poor people showed that, besides improved income and basic necessities, what they desired most was having 'a voice' (World Bank 1999). As the campaign for Article 19 of the International Declaration of Human Rights attests, there is a growing international demand for a 'right to communicate'; in rural Africa this largely translates into a desire for an increased power and ability to hear and to be heard.

In our analysis of the *Daily Nation* coverage, we noted that there were reports of the situation on the ground in remote parts of Kenya, such as Turkana and the north-eastern region. But these stories merely reported the facts of the environmental problem witnessed by the correspondent. There were no concrete proposals for tangible measures to be put in place to mitigate the effects

of climate change. With the extensive reach of mobile phones, media houses can now creatively build networks of citizen reporters to extend their newsgathering reach, via short text messages. SMS-based citizen journalist networks can offer opportunities to shift journalism away from the level of the purely urban and national political scene. But we did not come across such creative measures being used by Kenya media in our study.

7.4 ICTS and Climate Change and Action in Kenya

There is increasing evidence that technology is being used to varying degrees by the previously unconnected and disenfranchised to contribute to information exchange and, sometimes, to forms of participatory journalism in unprecedented ways in many parts of Africa (Mabweazara 2010; Moyo 2011). Information and communication technology has had an increasing impact on economic and social development over the past two decades, resulting from their capacity to generate and disseminate information, to facilitate the coordination of different actors in and beyond government and to make government, business and development processes more efficient (Creech et al. 2014).

With advances in new media technology, the power of the media to open up new opportunities to drive social change and transform national development in Africa is unsurpassed. But although ICT can significantly impact on climate change mitigation and adaptation, its use in this regard is currently less than in other development fields in Africa. The government of Kenya has identified ICT as a key enabler of the attainment of Vision 2030 goals and its aspirations. The thrust of the vision with regard to the ICT sector is to transform Kenya into a knowledge- and information-based economy by enabling access to quality, affordable and reliable ICT services through innovation and e-government (Communication Authority of Kenya (CAK) 2016). Further, the government of Kenya appreciates the fact that ICT has tremendous potential to accelerate the achievement of all the SDGs by enhancing capability to measure progress towards all the SDGs. It also provides access to new digitally enabled products and services that strengthen local economies, local innovation and local communities (CAK 2016, p. 122). ICTs have the potential to be invaluable tools in helping to actualise SDGs, especially among marginalised rural communities, owing to the high usage of ICT, especially through mobile telephony. In Kenya, the mobile phone subscription level stood at 40.2 million, which translates to 88.7% penetration rate by 2016 (CAK 2016). As the former UN Secretary-General Ban Ki-moon observed,

> We all know that information and communications technologies (ICTs) have revolutionized our world … ICTs are also very vital to confronting the problems we face as a planet: the threat of climate change … Indeed ICTs are part of the solution. Already these technologies are being used to cut emissions and help countries adapt to the effects of climate change … Governments and industries that embrace a strategy of green growth will be environmental champions and economic leaders in the twenty first century (cited in Horrocks et al. 2010, p. 1).

As we move towards 'knowledge societies', timely access to relevant, useful and quality information, including development information, is critical for making informed decisions and improving the lives of people. With the convergence of new communication technology with legacy media, the growth of the Internet and social media, as well as the increasing use of computer and mobile devices, the promises of information and media have increased considerably (Singh et al. 2017). This opens new horizons for every person to exercise their rights to freedom of opinion, expression and access to information and to be actors in, and beneficiaries of, sustainable development. This rapid growth in technology and media has opened up new forms of citizen engagement. The use of social networking platforms has created a virtual second world. The rise of the network society is a particularly relevant context for climate change communication. In the twenty-first century, the development of horizontal, interactive and global

online networks of communication has enabled large parts of the population to become active communicators in a new virtual public space. Starting with the blogosphere and developing into an ecosystem of different platforms, social media play important roles in climate change communication that are different from those of mass media (Schäfer 2012).

7.5 Conclusion

This chapter has examined the need to 'mind the media and information gap' in realising the SDGs in Africa. We have argued that attaining the SDGs requires the recognition that communication is central to all aspects of sustainable development. The role of the media as public watchdog, informer, educator and public mobiliser has been discussed within the context of realising SDGs with a special focus on climate change and subsequent action in Kenya. Access to information, especially for the marginalised communities who are worst hit by the effects of climate change in rural parts of Kenya, is critical in mitigating and adapting to climate change and variability. It has also been noted in the chapter that most news reports on climate change and action compete with other more 'business'-friendly stories, such as national and county politics, relegating climate change news to the back pages.

Furthermore, there is little focus on the plight of marginalised communities in rural settings in mainstream media. Our investigation on how well the media in Kenya has contributed to communicating climate change messages reveals that little is happening. For instance, despite the government declaring drought, famine and food insecurity national disasters in 2017, there is no major Kenyan media organisation which has established a climate change desk the way we have, say, a sport or political affairs desk (or specialist journalist focussed on the topic). There is, therefore, a need for more public interest-centred media to focus on the seeming less profitable climate change news to realise SDG 13 in Kenya. ICT makes this possible as it has shown to have the power to broaden communication and to empower rural communities (International Institute for Development 2012).

Effective communication of climate change information is critical for ensuring that decision-makers at all levels do indeed understand and are able to act upon such information (Budimir and Brown 2017). There are, however, relatively few studies of the role of the media in climate change action, adaptation and mitigation in Africa generally (Tagbo 2010; UNESCO 2015) and Kenya in particular. The level of understanding of climate change and its impact is still low, countrywide. This therefore calls for a focused awareness campaign that simplifies the science and impact of climate change in a language that is understandable by all segments of the society (Mutimba et al. 2010). As Tagbo (2010) noted, regular and accurate communication about climate change is the first step towards developing coping mechanisms in Africa.

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8 Small-scale Mining, the SDGs and Human Insecurity in Ghana

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Abstract

This chapter discusses small-scale mining in Ghana in the context of two intergovernmental development indicators—the United Nations (UN) Sustainable Development Goals 2030 (SDGs) and the African Union's Agenda 2063 (AU2063). Using the management and governance of artisanal and small-scale mining (ASM) activities in Ghana as a case study, we argue that the achievability of selected SDGs and the AU2063 aspirations in Ghana (and potentially in Africa more generally) depends on a political internalisation of a broader understanding of the (human) security of countries' citizens and peoples. For example, the laws and regulations governing small-scale mining in Ghana are not normatively developed and offer little voice and benefit to host peoples and communities in areas of abundant natural resources. This results in numerous human security threats and concerns such as destruction of communities and their livelihoods, violent clashes and environmental degradation among many others. The chapter argues that the ASM sector needs to be understood as involving fundamental human security concerns as part of the broader national, regional and global sustainability discussions, rather than the sectorial perspective in which the discussion is usually framed. Drawing from selected SDGs and AU2063 goals and aspirations, the chapter contends that the SDGs and AU2063 offer broad normative but also tangible metrics by which to assess the impacts of ASM in Ghana, and adopting human security as a governance and management indicator promises a more effective conduit for achieving selected SDGs and AU2063 aspirations in Ghana.

Keywords:

Development · Security · Mining · Governance

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8.1 Introduction

With 17 goals, the SDGs 'are a new, universal set of goals, targets and indicators that UN member states are expected to use to frame their agendas

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and policies over the next 15 years' (Ighobor 2015, p. 5). Among the 17 SDGs, Goal 3 aims at achieving good health and well-being whilst Goals 6 and 11 aim at achieving clean water and sanitation, and sustainable cities and communities respectively. The AU2063, on its part, aspires to achieve many goals by 2063, coinciding with the centenary of the founding of the Organisation of African Unity (OAU) in 1963. These aspirations include, inter alia, 'an Africa of good governance, democracy, respect for human rights, justice and the rule of law' (aspiration 3) and 'a peaceful and secure Africa' (aspiration 4). This chapter draws on the concept of human security as an overarching framework to bridge the aforementioned SDGs and AU2063 aspirations. Human security is 'the security people should have in their daily lives, not only from the threat of war but also from the threat of diseases, hunger, unemployment, crime, social conflict, political repression and environmental hazards' (Boafo-Arthur 2002, p. 1). The chapter uses this understanding of human security as a governance indicator to rethink the prospects and problems inherent in the management of artisanal small-scale mining (ASM) activities in Ghana.

We argue that the laws and regulations governing small-scale mining in Ghana are not normatively developed and offer little voice and benefit to communities in which there are abundant natural resources. For instance, while the entrenchment of multiparty democracy over the past two decades in Ghana has provided citizens with the opportunity to participate in the broader governance process, this has not yielded a meaningful involvement of citizens in relation to decisions on resource management and governance. Consequently, individuals and local communities continue to suffer dire socio-economic and environmental deprivations, thereby leading to a feeling of socio-economic and political dejection. This leads to a propensity to undertake or facilitate illegal mining, popularly called 'galamsey', as a 'legitimate' means of survival. Since ASM is largely unregulated, the above state of affairs leads to grave environmental externalities; most of these externalities are contrary to all three of the SDGs above. Thus, patronage in illegal ASM and its negative after-effects are the results of socio-economic and political insecurity among host communities. Therefore, the ASM sector, we argue, needs to be understood as involving fundamental human security concerns within the broader national, regional and global sustainability discussions, rather than the sectorial perspective in which the discussion is usually framed (Baldwin 1997; Antwi et al. 2017).

Collectively, the above-mentioned SDGs and AU2063 aspirations offer broad normative but also tangible metrics with which the impacts of ASM in Ghana can be assessed. However, on their own, each of the SDGs' and AU2063's goals and aspirations is insufficient to understand and assess the impacts of ASM in Ghana. Human security as a governance and management indicator, therefore, promises a more effective conduit for achieving the SDG targets and AU2063 aspirations in Ghana: it offers a comprehensive governance lens through which both can be bridged and collectively assessed. We, therefore, argue that the achievability of the listed SDGs and the AU2063 aspirations in Ghana (and potentially in Africa more generally) depends on a political internalisation of a broader understanding of the (human) security of people and communities. Put simply, there cannot be 'an Africa of good governance, democracy, respect for human rights, justice and the rule of law, and a peaceful and secure Africa' (AU2063), if there is no good health and well-being, clean water and sanitation and sustainable communities. Additionally, there cannot be good health and well-being, clean water and sanitation and sustainable communities without a human security approach to governance in which individuals and communities, and their environments are secured. The synergy here is that the AU2063 aspirations might only effectively be achieved through the operationalisation of the SDGs in respective countries.

8.2 The AU2063, the SDGs and Human Security

Broadly speaking, security is 'the alleviation of threats to acquired values, particularly those threats that are considered to have a degree of urgency and necessity about them' (Williams 2007, p. 1022). However, like many such important concepts in political science, security is not free from definitional and conceptual controversies. This is mainly because how one defines and conceptualises security—that is, what is to be secured and from what threat—determines what is an appropriate response to insecurity (Williams 2007). Debates about this have led to two main conceptions of security; namely, regime security and human security.

Regime security is generally the security of the state or its agents. As Hutchful (2008, pp. 65–67) notes, 'regime security emerges from a Western/Eurocentric concept of statehood in which to secure the state is to ensure security, and a security issue is that which threatens the state'. Thus, under regime security, the state becomes the primary value to be secured. Additionally, threats to the security of the state are usually deemed to arise from external or internal military or violent confrontations against the state (including its interests). As a newer conceptualisation of security, human security emerged in the mid-1990s, mostly in opposition to 'regime security'.

Proponents of human security insist that security must focus on the individual as the primary beneficiary, and not the state. The 1994 Human Development Report of United Nations Development Programme (UNDP) popularised the concept. It argued that human security 'is not a concern with weapons—it is a concern with human life and dignity' (UNDP 1994, p. 22). From this conception, human security was to have four core 'characteristics: it is universal, the components are interdependent, it is best ensured through prevention, and it is people-centred' (King and Murray 2001, p. 4; Newman 2010, p. 78).

From the above, human security can further be categorised into narrow and broad definitions. Narrow definitions are mostly simplified as freedom from the fear of political violence. Broad definitions focus on freedom from the fear of political violence but also freedom from want. Narrow and broader definitions of insecurity overlap with each other such that, if there is the threat of political violence, the basic wants of people are also threatened. On the other hand, people might resort to violence to protest a lack of protection of their socio-economic and environmental needs and aspirations. Human security in this chapter refers to the concept in its broadest sense, and emphasises the well-being of individuals, including the protection of individuals and communities from environmental, economic, social, cultural, psychological and other forms of harm to the overall livelihood of individuals (Hampson 2013).

In a sense, if the UNDP's Human Report Index of 1994 served as the beginning of the concept of human security, the UN's Millennium Development Goals (MDGs) and now the SDGs serve as the operationalisation of the concept in developing countries and across the world. In ensuring human security, the MDGs were to be a framework and a guide to the developmental agenda of developing countries. Former UN Secretary-General Ban Ki-moon described the MDGs as the 'most successful anti-poverty movement in history' (United Nations 2015, p. 3). Ighobor (2015), referencing the World Bank, indicates that the number of people living in extreme poverty (less than US$1.25 a day) worldwide fell from 47% in 1990 to 14% in 2015, while deaths of children under 5 years worldwide fell to 6.6 million from 12.6 million during the same period. These positive reviews of the MDGs, however, do not entirely reflect existing socio-economic situations for all countries, particularly in Africa. An MDGs' assessment report on Africa released by the UN Economic Commission for Africa (ECA), the African Development Bank (AfDB), the UNDP and the AU indicates mixed results. While there has been progress in areas such as women's political representation, maternal mortality and secondary school enrolment, Africa could not meet all the targets, including that on poverty,

ostensibly due to challenges such as poor implementation, inadequate funds and lack of coordination (Kakonge 2012). As Ighobor (2015, p. 4) notes, 'the reduction by more than half of the number of people living in extreme poverty, touted by MDGs proponents, was not universal.' Against the backdrop of this contested failure of the MDGs to end extreme poverty by 2015 in developing countries, the SDGs were adopted to build on the expiring MDGs, even though the SDGs, unlike the MDGs, were to apply to both developed and developing countries.

The original MDG of ending poverty and all the SDGs are priorities of African countries. In 2013, 2 years before the adoption of the SDGs, African leaders adopted their own development framework, the AU2063. In it, the AU outlined seven aspirations, with some semblance to the SDGs, perhaps because African actors were instrumental in negotiating the SDGs. The AU2063 aspirations envision the Africa that Africans would like to have by 2063. In 2002, the OAU morphed into the AU, in part due to changing global geopolitics but also due to the failure of the old structure to achieve much-needed development in Africa. African leaders have currently approved the first 10-year implementation plan of AU2063. However, we argue that achievement of the three SDGs noted above and two of the AU2063 aspirations, namely; 'an Africa of good governance, democracy, respect for human rights, justice and the rule of law (aspiration 3) and a peaceful and secure Africa' (aspiration 4) are primarily a question of governance.

The convergence between the SDGs and AU2063 is clear from the first AU2063 aspiration: 'We want a prosperous Africa based on inclusive growth and sustainable development, specifically an annual growth rate of at least 7% (the same as the SDG target), healthy and nourished citizens, and a three-fold increase in food and agriculture' (Ighobor 2015, p. 5). This convergence is a positive development as it showcases a consensus in development programmes. We, however, conceive of the SDGs as a conduit towards the AU2063, with the concept of human security as the analytical framework. We use the example of ASM in Ghana to illustrate our argument.

8.3 Ghana and the Galamsey Question

Galamsey—a corrupted enunciation of 'gather them and sell'—is a popular term used locally in Ghana to refer to illegal artisanal and small-scale mining activities. It is an informal, low-tech and labour-intensive mineral extraction and processing activity widely practised in many countries in sub-Saharan Africa (Hilson et al. 2017). While some ASM activities are licensed, most ASM firms operate illegally due to complex registration procedures (Hilson 2001). In Ghana, estimates suggest that some 200,000 people, both citizens and foreigners, are involved directly in ASM, the great majority of which are into galamsey (Hilson 2001). Over the past two decades, stakeholders including scholars, donors, and policymakers have argued for policies to formalise the ASM sector to enhance their contribution to economic development, but without success (Basu et al. 2015; Hilson et al. 2017).

In Ghana, ASM dates to the precolonial days. However, the implementation of structural adjustment policies in the 1980s created a new landscape of extractivism, i.e. the process of natural resource extraction mainly for the world market (Antwi et al. 2017). In that extractivist economy, large-scale mining became dominated by foreign multinational firms with ASM reserved for Ghanaians (Antwi et al. 2017). Unlike large-scale mining, the ASM sub-sector barely provides any coherent policy support for Ghanaians engaged in the sector (Basu et al. 2015; Hilson et al. 2017). Consequently, the sector has over the years remained highly informal and many of the activities go unregulated and hence often considered illegal. Furthermore, the recent surge in demand for gold on the international market, coupled with political leniency and corruption, and the poor monitoring of the operations of small-scale miners, has resulted in a booming galamsey sector including the active participation of foreigners such as

Chinese, Indians and Serbs (Crawford and Botchwey 2016). These new actors, endowed with better funding and technology, have changed the face of galamsey mining, moving it from a rudimentary activity with localised impact to a sophisticated activity that leaves large negative socio-economic and environmental footprints across Ghana. Among the strategies to stem the tide of negative impacts of illegal mining, Ghana banned all forms of ASM in 2017, following intensive public pressure through traditional and social media that compelled the government to act.

Due in part to the activities of miners and other unsustainable forms of land use, Ghana failed to meet the MDG target on environmental sustainability—forest cover and biodiversity loss (Government of Ghana (GoG) 2017). In recent times, the activities of miners, particularly through Galamsey, have had serious implications for the maintenance of good health and well-being, access to clean water and sustainable communities, particularly in rural areas. For instance, newspaper reports over the past decade paint a grim picture of the overall impact of mining on health, security, environment and social life (Table 8.1).

Also, a review of recent literature on galamsey's impacts showed that it is driving many forms of ecological and social changes. For instance, Boateng, Codjoe and Ofori (2014) examined the impact of galamsey on coca production in the Atiwa District of Ghana and found that farmers observed early dropping of immature pods, wilting, yellowing of leaves and low yield on cocoa farms closer to mined out areas. With regard to the impacts of artisanal mining on human health in Ghana, Basu et al. (2015) found that relatively high exposures to mercury and other heavy metals, occupational injuries and noise exposure existed across multiple mining communities. The study linked these risks to increasing psychosocial, nutrition, cardiovascular and respiratory, sexual, and water and sanitation-related health issues in Ghana. Snapir et al. (2017) examined the impact of galamsey on cocoa-growing areas and found that Galamsey more than tripled between 2011 and 2015, resulting in 603 hectare of direct encroachment on the Apamprama and Atiwa protected forest reserves. Again, the study found that galamsey is developing along most of the river network (for instance, the Offin, Ankobra, Birim, Anum and Tano rivers), with downstream pollution affecting both land and water.

Indeed, it could be argued that individual and/or communal feelings of socio-economic and political rejection and insecurity motivate locals to engage in illegal mining in the first place. Poor political regulation and governance multiplies the negative after-effects of ASM activities. This eventually affects people's well-being by, for example threatening the lives of city dwellers who depend on water sourced from rivers destroyed by galamsey, destroying communities and water bodies, and denying good health and well-being to multitudes of rural dwellers. Put simply, the lack of human security for people and communities has led to increased involvement in ASM and hence created the above negative impacts. Thus, a return to a human security conception of the sector promises a solution. We argue that a human security approach at the national level is necessary for achieving the SDGs by 2030 (good health and well-being, clean water and sanitation and sustainable cities and communities) as well as the AU2063 aspirations (justice, human rights, rule of law, security and peace).

8.4 Achieving AU2063 and the SDGs: Human Security as Governance Indicator

Ghana has set up an SDG implementation coordination committee to provide technical support for the implementation and monitoring of the agenda at the national level, and aligned its Long-Term National Development Plan (2018–2057) and the upcoming medium-term development plan with the SDGs (Ghana Statistical Service (GSS) 2017) (cf. Chap. 8). However, as the government sources indicate, Ghana can draw useful lessons from the MDGs to guide its implementation of the SDGs, particularly in

Table 8.1 Summary of an online newspaper report of the impact of Galamsey in Ghana (Boakye-Danquah 2013)

Impacts of mining	% Reported	Themes	Representative quote(s)
Rivers	340	Increase in mercury poisoning; the presence of metals in staple food crops; pollution of water bodies; shut down of dams and water treatment plants; high cost of water treatment due to polluted chemicals	The Ghana Water Company says it has identified cancer-causing chemicals in the Pra River, which serves as a source of drinking water for residents of some communities in the Western Region. Managing Director of the company, Fred Lokko, says the chemicals, which have polluted the river, and threaten lives, were released into the river through the activities of illegal miners. The Atiwa Forest reserve provides residents of Accra with about 60% of its potable drinking water as the source of the Birim, Densu and Ayensu rivers are in this reserve. The activities of illegal loggers and miners are threatening these water sources.
Forests	15	Mining in forest reserves	Eight people including five Chinese have been arrested for illegally prospecting for gold in the Kobro portion of the Apamprama forest reserve in the Bekwai District of the Ashanti Region. In December last year, the Nkawie district forestry commission arrested three Chinese and a Ghanaian prospecting for gold in the Asenanyo forest reserve near Nkawie.
Farming and farmlands	30	Farms, including cocoa farms removed for mining	Residents of Nwineso No. 1 in the Atwima Kwanwoma District and its surrounding communities have resisted illegal mining (Galamsey) operations in the area. They have called for government intervention to save their farmlands from being destroyed to safeguard their livelihood. If it does not stop, very soon most of the cocoa areas in the area will be deserted because the [farmer] will not suffer and later get it destroyed.
Children and youth	5	Death of children from falling into mining pits; abandoning of school by children; increase in teenage pregnancy	The Amansie West District recorded 3,000 cases of teenage pregnancy in 2014, the District Director of Health, Mr. Dominic Dorbbin, has disclosed and attributed the situation to the high rate of Galamsey activities in the district. Two young girls have drowned in an abandoned Galamsey pit at Manso Akropong in the Amansi West district of the Ashanti region. The girls aged 12 and 15 years went to a stream to wash their clothes when the unfortunate incident occurred.
Security and conflict	10	Conflict between miners and communities; miners buried alive; increase in gun violence in mining communities. Clashes between foreign miners and local communities, etc.	The anti-galamsey task force has seized 55 weapons, including 25 pump action guns, 24 single-barrelled guns, 6 pistols and a quantity of ammunition. Mr Bimpong says the situation poses a security threat. Illegal miners, popularly known as Galamseyers, operating at Tarkwa Nsuaem in the Tarkwa Nsuaem Municipality in the Western Region, last Friday, set on fire the palace of one of the chiefs in Nsuaem, culminating in the razing of the structure.

developing tools to measure in-country progress and so avoid mixed results as obtained from the MDGs (GSS 2017). Currently, achieving the good health and well-being of its citizens (Goal 3), having clean water and proper sanitation system (Goal 6) and having sustainable cities and communities (Goal 11) appear to be a major challenge in Ghana. We postulate that there are two main reasons for this.

First, poor governance, including poor natural resource governance—especially in the mining sector, does not secure resource fairness, particularly in the distribution of benefits between the national and the local levels and amongst the populace. Poor natural resource governance does not inculcate a culture of stewardship. Crawford and Botchwey (2016) found that illegal galamsey operators in Ghana hardly pay taxes to the government while legal concessioners often do not pay the mandated fees to local governments due to corruption and their connections to powerful state actors. The authors argued that, with corruption and the persistent informality, benefits from ASM are often captured by powerful elites and enrich a few powerful men at local level while the livelihoods of many women, children and youth involved have deteriorated. Second, the above-mentioned challenges also result from administering a governance regime that is at variance with the aim of securing individual and communal livelihoods and dignity. Many rural communities in Ghana that host mining firms are also amongst the poorest environmentally, socially and economically. This insecurity within host communities has led to violent armed conflict.

Noting the link between natural resource governance and insecurity, we postulate that a human security framework—in which governance prioritises the protection of the survival, livelihoods and dignity of local peoples—is a most viable way of achieving the two AU2063 aspirations. The human security concept has been criticised for being too elastic—capable of being stretched to cover anything, therefore covering nothing. However, we argue that the ultimate interest of the state must be, and indeed is, the interests of the people who make up the state. Therefore, a conception of security which forces the state to prioritise the interests of the people and their communities should be normal and legitimate.

Galamsey in Ghana affects the well-being of not only the host mining communities but also urban dwellers. This calls into question the narrow approach taken to address the negative ramifications of illegal mining. For instance, the government of Ghana has treated galamsey as 'security issue' which requires law enforcement, rather than as a human security issue which requires a broader, more comprehensive governance reform. The two most recent government attempts (in 2013 and 2017) to address illegal mining and its consequences involved the use of security task force to arrest and prosecute culprits (GoG 2017). The former Environmental Minister Mahama Ayariga argued that galamsey is simply a matter of law enforcement (Appiah 2016). This securitisation of the galamsey question has limited the state's capacity to develop a comprehensive and human-centred ASM policy. Indeed, the recent temporary ban on illegal mining by the government of Ghana is commendable given the adverse sociocultural and environmental impacts (Amankwah and Anim-Sackey 2004).

In 2017, the government of Ghana developed a new ASM policy, the Multilateral Mining Integrated Project that combines legislative enforcement and ecosystem and livelihood restoration (GoG 2017). However, given the history of such policy initiatives, the jury is out as to whether this new policy will curb the interests of powerful actors. Adopting human security as a governance indicator in the management of ASM remains a viable means of sidestepping the adverse impacts of ASM whilst improving community well-being. Indeed, a recent study has predicted that the SDGs may lead to global gains 'in security, capacity, and inclusion, and further extended scenario analysis

suggests that timely and effective interventions to strengthen governance and implement pro-poor development policies will result in much greater advances' (Joshi et al. 2015, p. 286). We consider this to be a call for a human security approach to mineral resource management.

A human security approach to governance will enable the protection of citizens' interests as opposed to those of foreigners as such protection determines the security of the state. According to the traditional conception of security, the presence of the Chinese, Serbs and Indians in Ghana does not pose a threat to Ghana, because they are not a direct armed threat to the state. However, the potential damage to other spheres of society is alarming. What does pose a threat are armed violent clashes between foreign actors and local communities, which have been on the rise (Table 8.1).

From a human security perspective, threats to the well-being of people and communities in Ghana manifests in diverse areas. For instance, the presence of large amount of metals in the staple crops of mining communities, the closure of water treatment plants and reports of 250 rivers in mining communities being polluted by cyanide and heavy metals pose serious long-term health risks (Table 8.1). The impact of mining on potable water sources has forced many communities to resort to other sources of water such as hand-dug wells (Appiah et al. 2013). As water from hand-dug wells and boreholes lends itself to various forms of contamination and is not as freely and communally available, this development presents health and economic constraints on predominantly rural communities where incomes are low. Conflicts arising from control of natural resources also threaten both the security of people and the communities in which they reside (see Table 8.1; Okoh 2014). Personal insecurity occurs when varied but substantial degrees of injuries are sustained by people due to unsafe mining practices (Kyeremateng-Amoah and Clarke 2015). For decades, there have been mining disasters in many communities across Ghana, and if the status quo remains unchanged, efforts to achieve the newly launched SDGs might yield little or no meaningful outcomes.

8.5 Conclusion: The SDGs and Beyond

Governance is the manner of managing a sociopolitical unit. The primary motive of governance is to serve the optimal interests of the people within that sociopolitical unit. Carefully conceived, these interests are ably subsumed under the seven components of human security: economic security, food security, health security, environmental security, personal security, community security and political security. Whilst the existence of the political unit is a prerequisite for people's interests, people's interests—hence human security—are fundamental to the existence of the political unit, in this instance, the state. Using the SDGs and the AU2063 aspirations, this chapter has argued that a comprehensive human security approach to the governance of ASM activities is a more viable way of ameliorating the problems associated with the mining sector in Ghana. The chapter maintains that it is only a human security approach—which guarantees the socio-economic and cultural security of people and their communities—that would lead to the achievement of good health and well-being, clean water and sanitation, as well as sustainable cities and communities (SDGs 3, 6 and 11). This will, in turn, yield an Africa of good governance, democracy, respect for human rights, justice and the rule of law, and an Africa that is peaceful and secure (AU2063 aspirations 3 and 4). This argument makes the SDGs a precursor to achieving AU Agenda 2063.

The institutional neglect of host communities by the state betrays the respect for individual and communities' interests on which participatory democracy inherently hinges. Human security as governance indicator therefore also means the adoption of a bottom-up approach to resource management, highlighting notions of partnership, local ownership and participation. Decisions about the kind of security and development policies to be adopted must include views from locals. This conception agrees with Kaldor (2011, p. 8) who argued that 'communication, consultation, and dialogue are essential tools not simply to win hearts and minds but to gain

knowledge and understanding and to lay the basis for the construction of appropriate institutions', hence they engender development and human security.

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9 Public Finance and the SDGs in Ghana

Ibrahim Bedi and William Coffie

Abstract

The Sustainable Development Goals (SDGs) require financing and domestic revenue generation to be realised. SDG 17 requires partnerships to attract finance, technology, capacity building, trade and resolve systemic issues. In Ghana, the SDGs are shaping national budgeting because the budget is aligned to the SDGs. Therefore, there is a need to assess how partnerships related to financing have helped in achieving the SDGs. This chapter examines how Ghana's drive to attain the SDGs is influenced by public finance. The chapter draws on qualitative data collected through interviews with key personnel at the Ghana Revenue Authority, Ministry of Finance and Economic Planning, the Ghana E-Governance Project, and Ghana Investment Promotion Council. The study finds that the national budgeting and revenue targets of Ghana are motivated by the need to achieve sustainable development goals for each year but this was not the case with trade and e-governance in the country. However, the e-governance project provides data to measure the progress the country has made towards achieving targets of the SDGs. The chapter contributes to the literature on the relationship between the SDGs and the national fiscal environment, as well as investment and trade.

Keywords:

Public finance · Ghana · E-governance · National budgeting

9.1 Introduction

Governments in developing countries are unable to finance public expenditure due to international price shocks and lack of access to foreign markets (Gavin et al. 1996). Government expenditure in sub-Saharan Africa has been challenged by fiscal policies that rely heavily on domestic revenue (Calderón and Nguyen 2016). This suggests, African governments continue to generate domestic revenue to support the increasing government expenditure associated with meeting the SDGs despite other inflows or aid. Foreign aid has been a significant source of public revenue in Africa for public expenditure (Combes et al.

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2016). Studies have found a negative relationship between foreign aid and domestic tax revenue generation (Heller 1975; Ghura 1998; Moss et al. 2008, Benedek et al. 2013). On the contrary, other studies found a positive relationship between aid and domestic revenue (Khan and Hoshino 1992; Clist and Morrissey 2011; Carter 2013; Clist 2014). This latter condition is the situation in Ghana and some African countries. Available public information contained in the budget statement and economic policy of the Government of Ghana shows Ghana's domestic revenue has grown by 104% between 2013 (GHS13,455.4 m) and 2017 (GHS27,481.1 m). Foreign aid or grants for the same period grew by 82% from GHS522.2 m in 2013 to GHS948.1 m in 2017.

The attainment of sustainable development goals (SDGs) hinges on the fiscal environment. The SDG 17 that aims to 'revitalize the global partnership for sustainable development' includes the finance component required to achieve the targets for this goal. According to Sustainable Development Solutions Network (SDSN) (2015), an estimated investment of US$2.4–5 trillion is required annually for the SDGs. In 2014, the United Nations Conference on Trade and Development (UNCTAD), indicated an estimated annual total investment of US$5–7 trillion to finance the SDGs. This level of investment requires effective revenue mobilisation domestically and internationally from both the private and public sector.

Domestic revenue is an important source for public financing for developing countries, and has been increasing in the face of dwindling international donor support for middle-income countries (Clist 2014). Middle-income countries such as Ghana have promulgated new public financial management acts and instituted a fiscal strategy to ensure fiscal space for sustainable budget expenditures, improve the effectiveness of public spending, reduce aid dependency, raise countries' creditworthiness and support good governance (Carter 2013). Prudent public financial management can help to leverage inclusive, sustainable private investment and can be complemented by international development aid where appropriate (Clist 2014).

Mobilisation and effective use of domestic public resources are one of the core actions agreed at the Third International Conference on Financing for Development held in Addis Ababa in 2015. The governments agreed and are expected to be committed to:

- enhancing revenue administration,
- improving efficiency and tax avoidance,
- addressing excessive tax incentives, particularly in extractive industries and
- enhancing transparency and accountability of financial institutions, public administrations and the corporate sector and to scaling up international tax cooperation.

The governments, as part of the measures to maximise domestic revenue, are expected to institute the following measures:

- Strengthen national control mechanisms.
- Increase transparency in the budgeting process.
- Improve governance.
- Phase out inefficient fossil fuel subsidies.
- Institute sound social, environmental and economic policies.
- Create democratic and transparent institutions.
- Strengthen an enabling domestic environment.

Ghana has embarked on fiscal policy reforms to improve domestic revenue mobilisation to support the SDGs. New fiscal laws including the Public Financial Management Act 2016 (Act 921) and the Income Tax Act 2015 (Act 896) help generate domestic public resources and encourage prudent public spending. These laws are intended to strengthen tax administration, reduce tax evasion, harness natural resource revenue or reform subsidies and are also intended to mobilise significant domestic public resources. Resources mobilised through fiscal reforms can be used in different ways to support various SDGs. Revenues from fiscal reforms can be partially earmarked for specific purposes, for example to improve energy efficiency and access to energy services (SDG 7)

or to mobilise other sources of financing (SDG 17), and can be useful in certain circumstances. The United Nations Environment Programme (UNEP) undertakes analysis on green fiscal policies across different sectors and provides advice to countries. Country studies in Ghana, Kenya, Mauritius and Mozambique have been conducted to identify options for fiscal policy reform to mobilise domestic resources and to create fiscal space for green investment, while addressing environmental externalities and social equity issues (UNEP 2016).

There is a dearth of country-level literature on how the quest to attain the SDGs is influencing revenue generation, trade and e-governance. Understanding this relationship can shape fiscal policy reforms, trade agreements and digitalisation of the economies of developing countries. This chapter discusses how the fiscal policies, trade and e-governance projects of Ghana are influenced by the targets in SDG 17. The objectives of the chapter are to:

- assess how revenue generation decisions are informed by SDG 17,
- understand how trade is designed to help achieve the SDGs and
- find out how the e-governance project of Ghana is informed by SDG 17.

9.2 Literature Review

High external debt has been identified in extant literature as a disincentive to government spending and domestic investment (Jenkins 1998; Ndikumana 2000). High debt results in 'debt overhang' where a greater portion of domestic revenue is used to service the debt leaving little for domestic investment (Krugman 1999; Ndikumana 2000). African countries suffer debt overhang which might be affecting adequate financing of the SDGs. According to Ndikumana (2000), a high debt burden exposes African countries to external shocks emanating from fluctuations in oil prices, foreign exchange and commodity prices. Ndikumana (2000) argues that high external debt has contributed to a decline in domestic investment in many African countries. Therefore, a high debt burden might be an explanatory variable for the level of SDG investment in Africa.

The spending philosophy of governments affects the allocation of resources. According to Ndikumana (2000), government consumption crowds out domestic investment through increased interest rates resulting from excessive domestic borrowing. Government consumption deprives domestic investment into priority areas such as those required under the SDGs. Ndikumana (2000) posits that African countries have performed poorly in terms of domestic investment. This might account for low funding of SDG activities and the level of achievement.

Domestic investment is affected by the presence of black markets (Ndikumana 2000). Ndikumana (2000) suggests that black markets promote diversion of savings which could have contributed to domestic investments. Black markets are common in African countries and their presence might be adversely affecting SDG investments and targets.

International trade has a positive influence on domestic investment (Ndikumana 2000). This finding suggests African countries with low and/or negative balance of trade accounts and saddled with large imports experience low domestic investment, which is likely to have an adverse effect on financing SDG activities. African countries largely depend on imports due to low domestic production and high costs which make local products uncompetitive. International trade creates imbalances in African countries through foreign exchange fluctuation and depreciation of the functional currency (Ndikumana 2000).

9.2.1 Ghana and the SDGs

The Millennium Development Goals (MDGs) first appeared in Ghana's national budget in 2013. They were replaced by the SDGs, which were first introduced in the 2015 national budget and have featured since then. Nevertheless, the structure of Ghana's budget makes it difficult to attribute the

national budget items to particular beneficiaries (Younger et al. 2017). The opinion of Younger et al. (2017) is true for the SDGs. It is virtually impossible to delineate activities or projects in the budget which can be attributed to a particular SDG. The SDGs are deemed incorporated in the activities. This concern has been expressed by the current Minister of Finance of Ghana (Hon. Ken Ofori-Atta) during the presentation of the 2018 national budget and economic planning policy to the Parliament of Ghana.

According to Younger et al. (2017), due to the progressive nature of the economic and social structures in Ghana, rich households are benefiting far more than their poor counterparts in major government social interventions. The interventions can be considered as addressing SDGs such as education, teacher and vocational training, electricity subsidies, health, fertility subsidies and value-added tax. This finding of Younger et al. (2017) suggests SDG interventions may not reach poor households in Ghana appropriately and sufficiently. Therefore, governments must promote pro-poor interventions to ensure the benefits of the SDGs reach them. An example of such a policy is the Livelihood Enhanced Against Poverty (LEAP) programme, which the government of Ghana has introduced. This programme offers stipends to poor households. The study by Younger et al. (2017) suggests that LEAP must be enhanced so that poor households feel the benefits of the SDG interventions. Another intervention which might help in making SDG strides in Ghana is the Free Senior High School policy, which waives the fees of students to increase access to secondary education. The School Feeding Programme is another intervention geared towards attracting and keeping pupils from poor households in school.

The President of Ghana, Nana Addo Dankwa Akufo-Addo, on 7 September 2017, inaugurated a 15-member Inter-Ministerial Committee for the implementation of the United Nation's SDGs. The Committee is charged to ensure that Ghana becomes a shining example for the implementation of the SDGs. In his speech, President Akufo-Addo noted:

> I wish to reiterate government's commitment to "leaving no one behind". Programmes and policies that have been outlined in our coordinated programme are all hinged towards the realization of the SDGs, both at the national and local levels. Whilst acknowledging that the realization of the SDGs will only be as good as how well they are financed, and how robustly results are tracked and measured, achieving the SDGs will require all the resources the country can muster. We must, therefore, be efficient and effective not only in mobilising resources, but also in eliminating pervasive revenue leakages, and addressing misallocation and misuse of public funds. Crucially, if we are to succeed in enhancing domestic financing of the SDGs, we must address the unacceptable leakage of resources in the form of wanton corruption.

This committee is expected to develop a coordinated approach to achieve the SDGs. The committee comprises of the ministers of Planning; Trade and Industry; Foreign Affairs and Regional Integration; Finance and Economic Planning; Food and Agriculture; Attorney-General; Environment, Science and Technology; Monitoring and Evaluation; Education, Health, Sanitation and Water Resources, Local Government and Rural Development; Gender, Children and Social Protection, Employment and Labour Relation; and Fisheries and Aquaculture. The composition of the Committee clearly suggests a commitment to address key goals in the SDGs. This is Ghana's first move in the localisation process to achieve the SDGs and to prepare the roadmap for Ghana to mentor other countries. These initiatives are as a result of the appointment of President Akufo-Addo as Co-Chair of the Advocacy Group of Eminent Persons in April 2017 by UN Secretary General António Guterres.

9.2.2 Trade

Trade helps in domestic revenue generation, which can contribute to finance the SDGs. Oil and cocoa represent strategic export commodities for the Ghanaian economy, prioritised within the Ghana Shared Growth and Development Agenda (GSGDA). The oil and cocoa sectors together represented around 40% of total merchandise exports in 2014 (UNECA 2014). Accordingly, the GSGDA makes it clear that the government

prioritises the private sector in the development of oil and cocoa with the hope of creating employment and improving tax revenue. Efforts will be made, according to the GSGDA, to ensure the success of the private sector within the oil and cocoa commodity chains. In particular, there is emphasis on the need for enhanced forms of foreign direct investment (FDI) to boost productive capacity in these sectors, and to usher in technological transformation.

Meanwhile, the GSGDA has been enthusiastically embraced by the country's main trade and development partners, including the European Union (EU). The most recent National Indicative Programme (NIP), signed between the Ghanaian government and the EU, indicates that the EU will provide the private sector in Ghana with necessary capacity building to support economic and social prosperity through export growth (UNECA 2014). Moreover, the EU has promised to provide further PSD assistance to mitigate certain risks associated with a free trade deal being negotiated between Europe and the West African region—the Economic Partnership Agreement (EPA). The EU's pledge to an Economic Partnership Agreement Development Programme (EPADP) will target PSD activities in those priority sectors (such as oil and cocoa) identified by West African governments in their individual national development plans (such as the GSGDA). These trade and aid ties are themselves underpinned by Ghana's membership of the African, Caribbean and Pacific (ACP) bloc, which signed the ACP-EU Cotonou Agreement in 2000 (UNECA 2014).

In addition, the EU as a leading trade and development partner under the Cotonou Agreement recognises the importance of oil and agro-processing for Ghana's achievement of sustainable development. The most recent NIP confirms that Ghana's lower middle-income status is based largely on its crops such as cocoa and more recently on oil and gas. Interestingly, however, the EU also emphasises that Ghana's signing of the EPA is essential for its long-term economic well-being. The EU points to how an EPA would secure low tariff access for Ghana's cocoa products (and other agricultural goods) into European markets. This is in apparent contrast to the Generalised System of Preferences (GSP), to which Ghana would default if it failed to fully implement an EPA.

One of the most crucial policy elements in terms of aligning Ghana's oil extraction to sustainable development objectives has been the government's and donors' emphasis on the need for adequate regulation of the proceeds derived from this commodity. In particular, there has been much focus placed upon Ghana's joining the Extractive Industries Transparency Initiative (EITI). This development platform emphasises the need to utilise oil proceeds for sustainable development.

9.2.3 E-governance

E-governance is the application of information and communication technologies to deliver government services, exchange information, communicate transactions, integrate systems and services between governmental units, industry and other stakeholders. E-government potentially enhances the social and economic development of countries by enabling improved access to government services. E-governance in Ghana offers a range of services, from better access to information on available services to completion of online processing of requests for permits, certificates, payments (Mensah 2016). According to Mensah (2016), with e-governance in Ghana, businesses and citizens can access and pay for services such as renewal of driving licences, apply for passports, pay taxes and acquire marriage and birth certificates.

Effective use of e-government can also improve the efficiency and effectiveness of the public sector and linkages between government agencies. Examples include the use of computers and networks to improve the personal productivity of government workers, and changes to more efficient business processes associated with a transition to electronic government services. In this context, an emerging imperative is to rethink

e-government policies and programmes to exploit these capacities.

E-governance for development aims at bridging the divides related to access, transaction costs and transaction time, enhancing trust through transparency, e-participation and e-inclusion. It is also argued that E-governance interventions should ensure that enabling conditions are created for the citizens to stay connected and have access to better ecosystems services.

9.3 Research Method

The qualitative research paradigm was employed with interviews as the data collection method. This approach was adopted to understand actions and activities deployed to SDGs, which quantitative data might not provide. In addition, the approach was employed to gauge the culture and attitudes associated with fiscal policies and systems for achieving the SDGs. The interviews were recorded with the consent of each of the interviewees. The interviewees are persons with extensive knowledge and experience at the entity/organisation. The following persons were interviewed to gather data (Table 9.1).

Table 9.1 List of interviewees

Interviewee code	Organisation	Job description
001	Ministry of finance	A tax adviser
002	Ministry of finance	A director
003	Ghana revenue authority	A commissioner of tax
004	Ghana E-Governance project	A director
005	National development planning commission	A director
006	Ghana investment promotion council	Investment business development officer

9.4 Findings and Discussions

9.4.1 Revenue Generation Decisions and SDG 17

The budget statement and economic policy of the government of Ghana for the 2015 Financial Year has an entire section on the MDGs titled 'Progress on The Achievement of the Millennium Development Goals' (Government of Ghana (GoG) 2015, p. 152). Paragraphs 760–786 of the 2015 National Budget discuss Ghana's achievement for each of the eight goals. This is evidence that Ghana's revenue projection is based on activities required to achieve the SDGs as captured in paragraph 555 of the 2015 national budget:

> The Government released capitation grant and paid subsidy for Basic Education Certificate Examination (BECE) for 423,000 final year JHS pupils. These interventions among others, contributed significantly towards Ghana's efforts at attaining the MDGs on education. Specifically, gross enrolment rate at Basic Education increased from 100.4% in 2012/13 to 104.1 % in 2013/14 academic year (GoG 2014).

The budget statement and economic policy of the government of Ghana for the 2016 financial year states:

> Mr. Speaker, the Commission hosted the high-level Inter-Ministerial Committee meetings to coordinate Ghana's position on the intergovernmental negotiations on the Sustainable Development Goals (SDGs) and its subsequent adoption at the UN General Assembly in September, 2015 (GoG 2015, p. 77).

Again, the 2016 National Budget has an entire section on the SDGs titled 'social protection, poverty reduction expenditures and sustainable development goals: Progress on the achievement of the millennium development goals and outlook on the sustainable development goals' (GoG 2015 p. 152). In 2016, the government intended to align expenditure to the SDGs in 2017 but this is yet to be fully realised since Ghana continues to base its national budget on the old format which does not delineate budget lines based on the SDGs. Therefore it is impossible to clearly identify all SDG activities from the budget.

Instead, SDG activities are budgeted for and incorporated in the budget. The Minister of Finance stated in the 2016 National Budget:

> Mr. Speaker, government recognizes that the 17 SDGs and their 169 associated targets are integrated and indivisible. In this regard, Government, together with its stakeholders, would in 2016 begin the process of incorporating the SDGs into its subsequent national development policy frameworks just as it was the case for the MDGs. We will systematically align expenditures with the SDGs and ensure effective monitoring and evaluation (M&E) to enable us track the targets within our planning system (GoG 2015, p. 157).

The influence of the SDGs on revenue mobilisation was captured under the policy initiative in the 2016 National Budget:

> Our middle income status requires the country to rely increasingly on domestic resource mobilization to meet its development needs. The pursuit of this agenda takes account of persistent budget deficits; the dwindling access to concessional financing; and requirements under the Financing for Development (FfD) component of the Sustainable Development Goals (SDGs). The new United Nations (UN) Sustainable Development Agenda (notably the FfD component) places emphasis on domestic resource mobilization as a more reliable way of ensuring and sustaining development (GoG 2015, p. 171).

In the budget statement and economic policy of the government of Ghana for the 2017 financial year, the Minister of Finance indicated that 'this budget is also informed by the United Nation's Sustainable Development Goals (SDGs) and the African Union's Agenda 2063' (GoG 2016, p. 32).

Respondents 001 and 002 indicated the government of Ghana's commitment to the achievement of the SDGs. Therefore, revenue targets are set to provide funding for projects and activities such as sanitation, school feeding programmes and primary health care. Respondent 002 indicated:

> Ministries, Departments and Agencies are required to justify their budgets with reference to the extent to which their activities lead to the achievement of the SDGs applicable to their sector.

The assertion of Respondent 002 is supported by a statement in the 2017 Budget statement:

> The Commission also supported all 216 MMDAs to align their Medium-Term Development Plans with the Sustainable Development Goals (SDGs) as well as the African Union's Agenda 2063 (GoG 2016, p. 66).

It is important to note that the 2015 and 2016 budgets were prepared by the previous government of the National Democratic Party and the 2017 budget was presented by the current government of the New Patriotic Party. The consistency of attention to the SDGs in Ghana's national budget suggests a concerted state-level effort and commitment to the targets in our revenue generation and national budgeting process. The change in government has not affected the Ghana's determination to align its budgeting to the SDGs.

9.4.2 Trade and SDGs

The budget statement and economic policy of the government of Ghana for the 2017 financial year gives an indication of consideration of the SDGs in the country's trade policies:

> The EPA will develop legal framework for environmental management for the following: four pesticides regulations; one regulation for waste; offshore oil and gas exploration regulation. The Agency will also commence implementation of hazardous waste and e-waste law, revise sector guidelines for the forest and wood industry, develop onshore oil and gas exploration guidelines, and localise the implementation of the SDGs (GoG 2016, p. 83).

The previous budget statements addressed the relationship between trade and the SDGs. Respondents 005 and 006 indicated that Ghana has embarked on investment promotion as part of its national agenda of attracting foreign direct investment. Trade agreements are not designed with specific SDG targets in mind. However, the benefits of trade contribute to meeting the targets of the SDGs. SDG 17 envisages that the private sector would contribute to achieve the SDGs through taxes and donations as well as employment creation, downstream business development and provision of social amenities. Therefore, the trade policies of Ghana need to be

designed with the SDGs in mind to achieve the desired results.

Trade is also a source of some of the global challenges as seen in the 'galamsey' (illegal mining) menace in Ghana which has led to the pollution of water bodies and could lead to Ghana's inability to meet SDG 6. Mining has led to the destruction of farmlands that could lead to hunger, making the attainment of SDG 2 a mirage. In Ghana, trade has also led to the importation of harmful drugs and food which could affect the attainment of SDGs 3 and 6.

The quest to attract foreign investment sometimes clouds sound judgment and leads to some of the abovementioned problems associated with trade. This assertion was confirmed by the Minister of Finance in the 2017 budget statement when he said, 'an inter-ministerial committee was set up to harmonise government policy with the goals on SDGs and also monitor and evaluate policies on annual basis' (GoG 2016, p. 132). This Inter-Ministerial Committee is yet to establish guidelines and the policies; until then, trade is carried out as usual.

9.4.3 E-governance project and SDG 17

Ghana has embarked on an e-governance project as part of the public sector reform strategy. This is expected to assist in managing the challenges associated with resource constraints and the collection of data for public sector performance measurement. The e-governance project was launched in May 2005 as a government-wide electronic strategy for the initiation, implementation and monitoring of value for money of activities and the sharing of information and knowledge. Respondent 003 indicated:

> The Ghana Revenue Authority has gained tremendous benefits from its online services and the introduction of the fiscal devices to track sales by retailers. This platform was developed to improve tax administration processes and prevent tax evasion.

Respondent 004 reiterated the benefits of e-governance but fell short of establishing the link between e-governance and the SDGs:

> I cannot say that the SDGs were the reasons for developing the e-governance project. However, I think the project would help capture relevant data that can be used to measure Ghana's achievement of the SDGs.

The e-governance project is expected to accelerate human resource development, ICT in education, export of ICT products and services, promote national health, facilitate national security, deploy ICT in communities and develop global value-added services as a business and ICT service hub (Respondent 004 2017).

9.5 Conclusion and Implications

This chapter has highlighted the need to consider finance, revenue generation, trade and e-governance in national policies on the SDGs. It is important for countries to embed the SDG culture in national budgeting, trade and e-governance. This study has established that Ghana has developed a culture of considering the SDGs in budget statements and the national development programme. However, trade agreements, investment activities and e-governance are not SDG sensitive. Our research shows that governments should use national budgeting, trade, investment and e-governance to achieve and track progress made towards the SDGs. An SDG assessment report must accompany all trade and investment proposals before they are approved by governments.

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Part II

Scientific Evidence and Critical Thinking on the SDGs in Africa

10 Research Data Management and Scientific Evidence: A Strategic Imperative for SDGs

Constance Bitso, Elisha Ondieki Makori and Sellina Khumbo Kapondera

Abstract

Scientific evidence comprises Data, Information and Knowledge (DIK) often presented in a pyramidal structure. Data are the foundation base of the pyramid, followed by the information layer and the knowledge layer at the top. Data are rudimentary and expand into information and knowledge—the DIK pyramid—and also constitute scientific evidence. Such evidence is critical for demonstrating prospects, best practices and successful development models. The Internet and the evolution of the Web have resulted in easily discernible data that serve as scientific evidence in the form of big data. Transformation of the African continent through the 17 Sustainable Development Goals (SDGs) rests on the availability of scientific data. Data are not a panacea for societal problems but data science can nevertheless open up possibilities for innovations that could help fight hunger, poverty, inequalities and underdevelopment. There is also a huge potential for big data to serve as evidence for successes and failures of the SDGs. However, without its proper creation, planning, verification, storage, security and organisation; big data cannot be used appropriately. This is where Research Data Management (RDM) adds value, mainly because RDM is concerned with planning and organisation of data in the entire research cycle, including the dissemination and archiving of results. This chapter draws on examples from Kenya, Malawi and South Africa to analyse RDM as a strategic imperative for scientific evidence in the transformation of Africa through the SDGs, with a specific reference to SDG 4 on the quality of education.

Keywords

Data management · Scientific evidence · Quality education · Africa

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10.1 Introduction

The United Nations 2030 Agenda on Sustainable Development is a representation of 'a new coherent way of thinking' about the natural, social and economic essentials (Nilsson et al. 2016, p. 320). These authors argue that a palpable fundamental to the agenda of the SDGs is

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implementers' (citizens, researchers and policymakers) capability to theorise, conceptualise and visualise the 'connecting dots' that help to intertwine the goals with respective specific targets and indicators even though their interdependency has not been spelled out in any of the UN publications. Approaching the implementation of Sustainable Development Goals (SDGs) in silos or as separate entities will be incoherent and counterproductive. The SDGs champion inclusivity in diversity while also balancing contextual interests and priorities for efficient and effective implementation in various unique settings. Coherent policies and strategies for the SDGs demand policymakers to work on principles, methodologies and rubrics for thinking systematically and multilaterally to identify allies, collaborators and potential partners (Jones et al. 2008; Moyo and Sowa 2015). Of utmost importance, policymakers 'need up-to-date empirical knowledge on how the goals and interventions of one sector affect another positively or negatively' (Nilsson et al. 2016, p. 321). These authors contend that the achievement of SDGs requires knowledge-based actions on all dimensions, targets and indicators.

This chapter explores how the provision and management of data, particularly research data, as a major contributor to knowledge inputs, can enable action research and action learning at multiple scales of the learning subsystems to demonstrate success or failure of SDGs (Huys et al. 2004). The main argument of the chapter is that if data are not properly managed, scientific evidence to demonstrate value and return on investment in SDGs will be difficult to measure. In this chapter, we therefore argue for Research Data Management (RDM) to be viewed as a strategic imperative for the SDGs. RDM refers to a set of services dealing with storage, access and preservation of data generated from research projects that support the full data life cycle including data management planning, digital curation, metadata creation and conversion of datasets (Chiware and Mathe 2015). The specific objectives of the chapter are to:

- explore the role of RDM in provision of testimonial data (scientific data) for deliverables of SDGs;
- establish what scientific evidence tells us about priorities for African states for informing the direction and implementation of SDGs;
- determine sources of data to uncover the silences in SDGs and obstacles which should be removed in order to realise the objectives of any of the SDGs; and
- find out which methodologies can be used to harness data that reveals the success or failures of SDGs.

10.2 Contextual Framework

Library and Information Science (LIS) is founded upon management of data, information and knowledge, entities often presented in a pyramidal structure. At the bottom of the pyramid is data, followed by information and knowledge with wisdom at the apex (Fig. 10.1). Due to its intangibility and complexity, wisdom is impossible to harness into a manageable entity. It is a known fact that data are the foundation for information and knowledge. As argued by Ackoff (1989) and visualised by Bird (2008), scientific evidence comprises data, information and knowledge which results in wisdom (applied knowledge). Consequently, the fundamental pillar of LIS is the Data, Information, Knowledge and Wisdom (DIKW) model, often presented in a pyramidal structure demonstrated by Bird (2008) as follows:

Data are rudimentary and expands into information and knowledge. Considering the DIKW model, data management presents a new opportunity for librarians to support the research process. Although in the past it seemed daunting, librarians' experience with organising information so that it can be found has proved to be the skill needed to provide data management services (Surkis and Read 2015). In developed

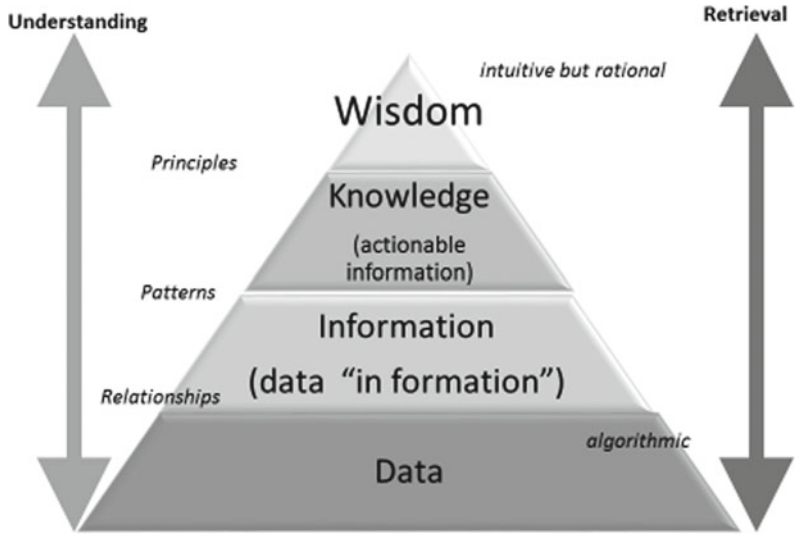

Fig. 10.1 DIKW model (Bird 2008)

countries and a few African countries, librarians have taken on a number of roles grounded in the principles of data management, including working towards bridging the gaps between librarians and researchers (Chiware and Mathe 2015; Cox et al. 2016; Cox et al. 2017).

Scientific evidence is testimonial data that is critical in demonstrating prospects, best practices and successful development models. It has potential to reveal, as evidence, societal challenges, problems and crises. The Internet and its evolution have resulted in easily discernible data that serve as scientific evidence in the form of big data (Cope and Kalantzis 2016). The premise that the achievement of SDGs requires knowledge-based actions makes knowledge availability and accessibility an imperative. Considering the data, information and knowledge pyramid, we argue that without data there will be no information and knowledge. We propose that RDM guides the planning and the entire process of sourcing, collecting, storing and openly sharing data as scientific evidence to support strategic actions and informed decision-making. Currently, open sharing of data is possibly inhibited by factors such as unwillingness of researchers to embrace open scholarship; scepticism around open data; limited awareness of research support tools and platforms for open data; limited knowledge of metadata for data description as well as protection of data as one's intellectual property. Moreover, knowledge-based actions must be grounded in expertise, empowerment and continuous research and learning, which in turn require the use of relevant and adequate data, as well as information and communication technologies as essential inputs and catalysts (Nilsson et al. 2016).

10.3 Research Data Management

Given that the data life cycle is integral to RDM, it is crucial to unpack it prior to discussing RDM. Figure 10.2 illustrates the research data life cycle from the UK data archive.

'Data lifecycle stages require data management to ensure that the researchers document how they collected their data, transformed it from raw to processed, analyzed data; ensuring that it is described in an understandable manner' (Surkis and Read 2015, p. 154). The stages are important because understandable data easily leads to scientific testing, validity of original results or reanalysis of data in an entirely different context.

All DIK stakeholders, libraries, institutions, researchers and funders have been pooling scarce resources to build infrastructure and expertise for data management (Berman and Cerf 2013).

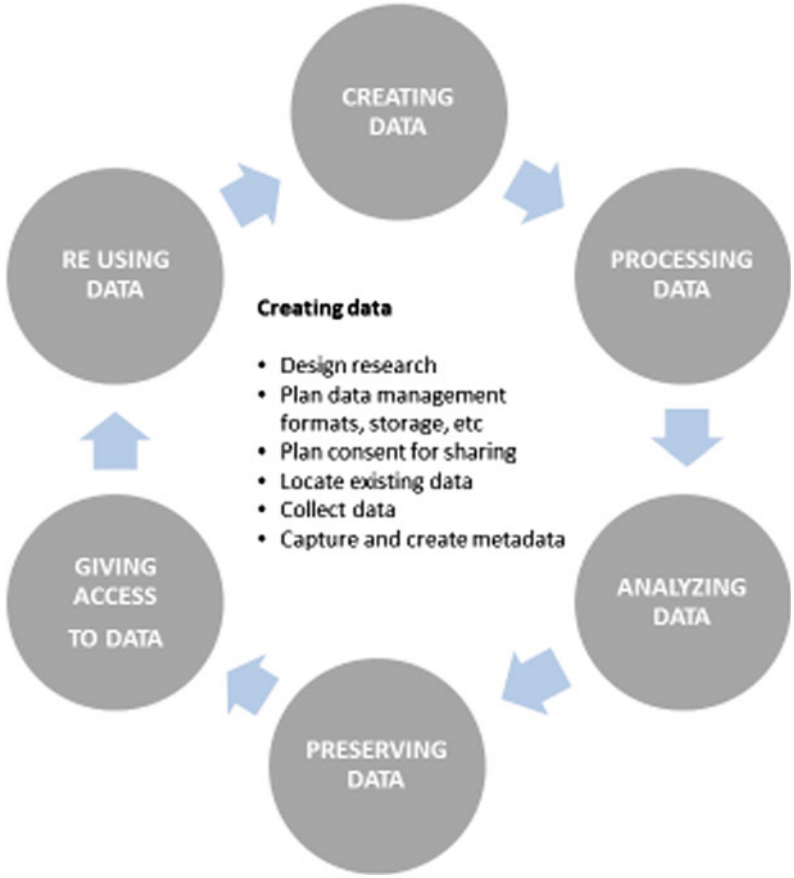

Fig. 10.2 UK data archive illustration of research data life cycle (http://library.nuigalway.ie/digitalscholarship/researchdata/researchdatalifecycle/). Accessed 20 September 2018

The outcome includes initiatives such as consortia for negotiating licences for software, programmes and electronic resources. In view of open scholarship, open science and open data, some governments, international organisations, funding agencies and publishing houses have issued a series of RDM policies in recent years. Researchers are encouraged or required to share research data along with their research outputs. It has become mandatory in many countries such as Australia, South Africa, the United Kingdom and the United States for research funded by public funds to comply with open data policies, that is, publications and data emanating from publicly funded research should be deposited in open data repositories. Therefore, research data sharing and reuse during the research data life cycle has become paramount. Additionally, researchers are now required to submit their RDM plans when they apply for funding. These movements have presented an opportunity for data to be accessible, thus making scientific research that serves as evidence for SDG indicators available to the public.

10.4 Unpacking the Role of Data as Scientific Evidence

Science has been going through a paradigm shift (Hey et al. 2009). It started as experimental science, which primarily focused on natural things, and then became theoretical science characterised by the evolution of scientific laws, principles and equations. This was followed by computational science, which featured simulations of phenomena, and ultimately arrived at the current science paradigm for the digital age: collaborative and

computational data-intensive science, whereby data are captured by instruments and generated by technology through simulations and sensor networks. Data-intensive science, also known as e-science or e-research, relies on technologies and tools to support data amalgamation and collaboration for analysis and data mining, data visualisation and data exploration for scholarly communication (Tenopir et al. 2011; Rieger 2010).

Data drives science and constitutes the foundation for research and innovation. Consequently, it is important to put systems in place that will advance research tools and technologies for data management. The critical aspects are data acquisition and modelling, collaboration and data visualisation, learning analytics and data mining, dissemination and sharing of data, archiving and preservation of data.

We therefore argue that some of these data could serve as scientific evidence for SDGs such as good health and well-being, gender equality, clean water and sanitation. Testimonial data enable the implementation and monitoring of the SDGs. Thus, SDG indicators are part of big data and therefore should be FAIR (Findable, Accessible, Interoperable and Reusable). FAIR data offers a unique opportunity to ensure that the benefits of big data and the data revolution are extended to under-resourced countries and communities so that no one is left behind. So far, RDM and data curation is proving effective in making data FAIR. Governments, decision- and policymakers need to embrace big data as scientific evidence that should be FAIR, because it potentially impacts on sustainable development practices and policies.

Scientific evidence is data, information and knowledge gathered from scientific research that has been conducted ethically, methodically and systematically, using established research methods and approaches with validity and reliability (Mårtensson et al. 2016) that takes much expertise, time, resources and patience to conduct. For research to be meaningful, it has to be presented and communicated in accessible language to make it possible for decision-makers to accept it as evidence (Saunders 2013). According to Compound Interest (2015), scientific evidence in health and medicine consists of anecdotal expert opinions, animal and cell studies, case reports and case series, cohort studies, randomised controlled trials and systematic reviews. Arguably, these sets of evidence may be extended to other disciplines. There is no doubt that scientific evidence has to be authentic, without bias; of critical importance, it should be conducted through scientific research designed to produce quality data, information and knowledge that can serve as evidence for actionable results.

Transformation of the African continent through 17 sustainable development goals rests on the availability of scientific data with which to measure successes and failures. Although data are not a panacea for systemic societal challenges; the diffusion of data constitutes a genuine opportunity to implement innovative strategies, and to tackle poverty, hunger and social exclusion (Letouzé 2011). For big data to be useful for SDGs, it should be properly created, planned, verified, organised, secured and stored. This is where RDM could add value to SDGs, because it is mainly concerned with planning and organisation of data in the entire research cycle, including dissemination and archiving of results (Whyte and Tedds 2011). Intrinsic scientific processes yield data that is well managed through systematic RDM.

Evidence of models and mechanisms providing positive outcomes in delivering science literacy, including health literacy, is essential in order to build on what is known and also to adapt or develop innovative new approaches where there may be gaps or failings. Saunders (2013, p. 3) raised thought-provoking arguments on scientific evidence by commenting that

> [Scientific] evidence is presented by proponents in much the same way that evidence is given in a court case, usually to back up policies or decisions that will impact people's lifestyles. But, unlike in a court case, we are rarely told exactly *where* the evidence comes from and *why* it's evidence. Most of us hear of 'scientific evidence' from journalists, newsreaders, politicians or media commentators, and often we don't have the opportunity to check the facts ourselves.

DIKW resource description including datasets is done through creation of metadata, which represents the existence of intellectual property, content creators, digital object identifiers and other bibliographic details of the DIKW resource. The effort to create metadata for DIK resources and research datasets is very different from what is required for research publications. While publications can be accurately described by librarians, good quality metadata for research datasets (scientific evidence) require the contribution of researchers involved in its production. Their knowledge of the domain is required to adequately document the way the dataset was produced so that others can reuse it. 'Involving the researchers in the deposit stage is a challenge, as the investment in metadata production for data publication and sharing is typically higher than that required for the addition of notes that are only intended for their peers in a research group' (Amorim et al. 2016, p. 2). As the research paradigms in science become data-intensive and collaborative (Hey et al. 2009), researchers are promoting data as the 'infrastructure of science', critical in forming 'the basis for good scientific decisions, wise management and use of resources, and informed decision-making' (Tenopir et al. 2011, p. 1). Although cultural differences exist between the disciplines of social sciences and natural sciences, the former is changing to require greater access to data and more transparency (Guest et al. 2012; Elman and Kapiszewski 2013). Both of these call for a strong emphasis on data devolution, depositing and sharing, which is achieved through RDM.

10.5 Tripartite Matrix: Scientific Evidence, African States' Priorities and Sustainable Development

The foundation of SDGs is to promote the quality of life through economic growth, social inclusion, better health and education, and environmental protection. Under this new strategy, countries and their national development plans need to implement transformation priorities, policies, programmes and projects for economic, social and political development and growth anchored in 17 SDGs (United Nations Development Programme 2016). In the process of implementing the SDGs, scientific evidence must provide valid and accurate data about the priorities of African states in a seamless tripartite matrix. Scientific evidence forms the fundamental basis that provides the parameters and indicators necessary for achieving sustainable development practices by African states. RDM makes research data available for critical analysis of reliable and credible information, which is required for strategic planning and decision-making. The direction and implementation of SDGs require knowledge, research programmes, collaboration and partnership between policy-makers, practitioners and other stakeholders. RDM is an important field of research and practice increasingly employed to provide value-based scientific evidence that can be useful in supporting practical application and implementation of SDGs. Sustainable development practices are built on quality research and educational programmes (Siobhan 2014) as well as information, knowledge and information communication technology. The tripartite matrix offers a seamless way of connecting the scientific evidence with the priorities of African states in SDGs through RDM.

10.5.1 Role of RDM in Provision of Scientific Evidence for SDGs Deliverables

Novel approaches of RDM integrating DIK into practicable planning and decisions have helped to translate the SDG pillars into tangible deliverables. The quality education in South Africa, Kenya and Malawi is important for the much needed scientific evidence to support the increasing usefulness of RDM in achieving the SDGs. Education plays an important role in transformation, changing human beings and society through scientific evidence. It is crucial for reducing vulnerability to economic, social and environmental dislocation and building more

resilient systems. In developed countries, research indicates that education enables people to perform better economically, it enhances health and extends life span, it promotes civic engagement and also improves a sense of well-being (see International Council for Science and International Social Science Council 2015; Karani and Preece this volume).

Sustainable education also needs strong support from the stakeholders whose critical inputs are useful in providing information for planning and decision-making. According to United Nations Educational, Scientific and Cultural Organization (UNESCO) (2014), the roadmap for implementing the global action programme on Education for Sustainable Development (ESD) includes increasing the capacities of educators and trainers to more effectively deliver education for sustainable development, scaling up education for sustainable development programmes and mobilising multi-stakeholder education for sustainable development networks. Therefore, data become scientific evidence to serve as indicators of positive or negative change in these efforts. The degree of achievement or failure of the transformation agenda deliverables can only be determined with scientific data. For instance, the number, duration, content and implementation period of an education programme can serve as data for monitoring and evaluation of such a programme. Moreover, in a multicultural and multiracial terrain such as South Africa, the inclusion of different races and cultural groups in a network can serve as testimonial data of a multi-stakeholder network.

The notion that RDM is a strategic imperative for SDGs' scientific evidence compels policymakers and practitioners to understand RDM and its dynamics. This is because 'the scale and complexity of RDM support requirements mean that a wide range of services from advocacy to technical support, are needed at different stages of the research data lifecycle' to effectively harness data that will serve as SDG indicators (Cox et al. 2017, p. 2195). In their international study of RDM activities, services and capabilities in higher education libraries, Cox et al. (2017) observed that skills and capabilities necessary are not yet in place in many parts of the world. Furthermore, these scholars observed glaring inconsistency in the delivery of RDM support service. It is apparent that RDM support service has not yet matured into models and theories. In the implementation of sustainable quality education particularly in the African context, there is a need to expeditiously prioritise RDM skilling and capabilities.

Sustainable quality education also needs the collaboration and support of people, communities and stakeholders. Research in data management underlies the practical issues and challenges of sustainable quality education. This brings into focus the need to produce and share data, information and knowledge from multifaceted approaches and strategies, and to make these available to policymakers, practitioners and societies. The modern digital economy requires entails strategic planning and decision-making processes that depend upon RDM analytics in order to provide timely information through technological solutions, The Internet of things and social media platforms. This validates the fundamental aspect of aligning RDM with the practices and policies of the SDGs.

10.5.2 Planning and Implementation of Quality Education

Stronger emphasis on planning and implementing quality education is important in understanding the numerous dynamics and challenges that African countries normally face, ranging from limited resources to human personnel. Implementation processes supported with scientific evidence and research must provide information and knowledge from all the stakeholders in the lifelong learning process (see Karani and Preece this volume). In implementation of sustainable education for development, it is mandatory to provide for inclusive participatory engagement, tailor the goals to the local context, plan well and monitor and evaluate the results.

As the field of big data continues to grow and evolve, coordination will be necessary to assess educational needs. The education and training

community will help determine how to structure the data science curricula and how to reallocate educational resources to meet the demand for specific skill sets. At this early stage, maintaining agility and flexibility in undergraduate as well as graduate curricula and programmes is necessary to ensure that cutting-edge concepts and techniques are being incorporated (Networking and Information Technology Research and Development Program 2016).

In African countries, education for sustainable development is a societal value that should include all the stakeholders including national, county, local community, institutions and academia. Information and knowledge generated through education, training and learning provide the foundation for sustainable development policies and practices. A study on evaluation and analysis of case and baseline studies from South Africa, Kenya and Malawi provides useful information in relation to the quality of education and its priority in the African context. In principle, government policies and implementation programmes should be built on solid data, information and knowledge.

10.5.3 Best Practices and Innovations for Research Data Management

Transforming and changing societies through quality education helps African countries and the world in general to understand best practices for sustainable development. Sustainable development practices need to prioritise needs and to ensure proper utilisation of scarce resources. This implies that the priority of the goals and targets determines the allocation of resources in the process of transforming the society at large.

As mentioned earlier, librarians are potential drivers of data management. Nonetheless, because RDM is still an emerging area, there is still uncertainty in many libraries. Consequently, the literature on the best RDM methodologies, practices, models and theories is yet to be developed. Cox et al. (2017) observed that multi-stakeholder involvement in RDM activities and services often includes librarians, research support services, research funding agencies and IT service departments in many higher education institutions. In the RDM arena, collaborations and partnerships are therefore a necessity even though, from time to time, they are likely to result in conflict or tension between the various professionals (Si et al. 2015). There is yet another uncertainty cloud on RDM collaborative frameworks. Moreover, within the library itself, there is still some testing of RDM practices, particularly as to how the current cohort of librarians are going to embrace new roles associated with RDM. Considering that anything could possibly be a source of data, currently multidisciplinary, interdisciplinary and transdisciplinary approaches seem to be a safe mode of practice. Hence, the need for researchers, policymakers and practitioners to establish communities of practice for their RDM activities.

10.5.4 Linking RDM to Data Interconnectedness

Interconnectedness is evident in scientific research given that scientific research is a participatory and inclusive process where various stakeholders such as researchers, research participants, implementers, decision and policymakers as well as funding agencies are involved (Networking and Information Technology Research and Development Programme 2016). In the context of FAIR, interoperability and reusability are testimony to the interconnectedness that underpins open scholarship. We argue that interconnectedness solidifies the Internet of things, big data revolution and linked data, all of which create data that can be harnessed as scientific evidence or testimonial data for the SDGs. There is no doubt that SDGs must be supported with reliable RDM and sharing activities, mainly because data collection and management through various sources help to uncover the silences and obstacles which might hinder the achievement of the SDGs. Data collection and management methodologies have to be systematically applied to determine success or failures of SDGs.

10.6 Conclusion

This chapter has discussed the need to generate and manage data in ways that contribute to both the realisation and monitoring of SDGs. It has used the African contexts to argue that RDM should be viewed as a strategic imperative for SDGs. Thus, RDM is an important field of research and practice increasingly being employed to provide value-based scientific evidence useful in supporting practical application and implementation of the SDGs. It provides much needed relevant and credible data, information and knowledge fundamental for strategic planning and decision-making for policymakers, practitioners and other stakeholders. For RDM to achieve this, it needs to be aligned with practices and policies of SDGs. Librarians are called upon not only to facilitate such an alignment but also to organise and support research, and to make relevant information and knowledge easily accessible.

The chapter further highlights that scientific data should be properly managed and also made discoverable to a broad range of stakeholders involved in decision-making and in the implementation of SDGs. Scientific knowledge is crucial for the delivery of quality education, which is, in turn, necessary for broadening participation in SDGs. African states need to invest heavily in generating scientific knowledge and data relevant to their needs and for meeting the SDGs. The alternative of relying heavily on data generated from the Global North might be damaging in the long run if such data do not speak to African conditions. African states need real practical solutions built on scientific research and evidence in order to achieve the rudimentary goals of sustainable development practices.

In the modern digital economy, physical barriers need not be an obstacle to participation in SDGs by various groups of people as technological advancement has created multiple virtual spaces that enable participants to make their input into implementation, management and monitoring of SDGs. The modern digital economy renders strategic planning and decision-making processes dependent on RDM analytics that provide timely data, information and knowledge through technological solutions, the Internet of things, linked data and social media platforms. This means that policymakers, practitioners and the general public can use technology to produce and share data, information and knowledge from multifaceted approaches and strategies. This draws attention to the role LIS should play in the age of SDGs and how that role transforms the profession of librarians, especially their involvement in society.

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11 Prioritising Health Systems to Achieve SDGs in Africa: A Review of Scientific Evidence

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Abstract

The Sustainable Development Goals (SDGs) provide a framework for streamlining efforts towards achieving global development objectives. The SDG 3 on universal good health and well-being remains an international priority. Recent reports indicate that although progress has been made, most developing countries face health system challenges and are still far from achieving SDG 3. We examine scientific evidence to infer priorities for African states that could inform the direction and implementation of SDG 3 in Africa. The chapter focuses on shortfalls in health systems, particularly with health information systems and human resources for health. It also highlights strategies to strengthen these systems and promote sustainable capacity building. Health information systems (HIS) are important data sources for evidence-based health policymaking, research and evaluation, training and service delivery. However, inadequate provision of reliable, valid and comparable data in resource-poor settings threatens meaningful progress in realising SDG 3 targets. We review the literature and discuss progress and challenges in the collection, synthesis and use of health information, and give recommendations on improving HIS evidence in such settings. Human resource is a key component of strong and resilient health systems, without which implementation of evidence generated from HIS into meaningful practice is unachievable. We also discuss health workforce hurdles to health cooperation, coverage and training that may affect the attainment of SDG 3. Improvements in HIS and adequate capacity building will undoubtedly highlight key silences and obstacles in SDG 3 actualisation and inform health policymakers, practitioners and researchers on innovative strategies for better health in African countries.

Keywords

Sustainable development · Health systems · Health information · Health workforce

The original version of the Chapter was revised: correct affiliation of the chapter author "Benard Kulohoma" has now been updated. The erratum to the book is available at https://doi.org/10.1007/978-3-030-14857-7_27

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11.1 Introduction

The 17 Sustainable Development Goals (SDGs) adopted in late 2015 constitute comprehensive, renewed efforts across the globe to tackle social, environmental and economic development issues related to humanity and the planet by the year

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2030. The third goal (SDG 3) aims to 'ensure healthy lives and promote well-being for all at all ages' and acknowledges good health as a universal and fundamental human right across the life course (UNDP 2015). The central role of health in sustainable development is incontestable, as both a determinant and an outcome of progress in other development sectors (Hanefeld et al. 2017; Nunes et al. 2016). Several SDGs (2, 6, 7, 8, 11, 12, 13 and 16) also inherently contain health-related targets (World Health Organization (WHO) 2017). We therefore argue that successful implementation of SDG 3 by African states ought to take more coordinated and integrated approaches as the attainment of any SDG 3 target is linked to and facilitates achievement of other goals (Kickbusch and Hanefeld 2017). Such cross-cutting strategies to realise health-related targets have been hindered by factors such as the narrower focus on a few health goals within the previous Millennium Development Goals (MDGs) (UN 2015), prevailing disease-specific or population-specific vertical funding programmes, inefficient resources, poor governance and fragmented health systems (Atun et al. 2008). To be successful, SDG 3 warrants health systems thinking that would foster synergy across different components of the health sector.

Health systems can be viewed as the interconnection of several components concerned with health. These include individuals, families, communities, institutions and organisations, such as health financing bodies and health ministries (World Bank 2007). Health systems play a vital role in connecting health interventions with the population, and weak health systems were cited as a key impediment for many African countries in achieving health-related MDGs (Kirigia et al. 2016).

Africa's development agenda remains substantially focused on health system-related issues. A recent public attitude survey of 36 African countries highlights inadequacies in Africa's health systems such as barriers to basic health services that include health facility shortages, inaccessible medical care and poor governance for basic health services strengthening (Armah-Attoh et al. 2016). Such findings are contradictory to the new SDG 3 agenda, since a core theme is to ensure equity, universal coverage and sustainability of health care across populations.

The WHO describes a framework that classifies health systems into six building blocks: health services, health information, health workforce, medical supplies, financing and governance (WHO 2007). The framework has previously been applied in guiding health systems strengthening efforts in various settings and can be a useful tool in monitoring progress and performance of countries towards the achievement of SDG 3 (Manyazewal 2017). Strengthening health systems is identified as a 'key line of action' within the SDG 3 agenda (WHO 2017), and the performance of health systems bears a strong influence on differences in summary measures of disease between countries (Sepanlou et al. 2017).

This chapter identifies priority areas within specific SDG 3 targets from a health systems perspective. It examines two health systems components: health information systems (HIS) and human resources for health (HRH), and makes recommendations for prioritising SDG 3-related objectives. We acknowledge that health systems are different and also complex, and that their effective functioning depends on the local social, economic and political contexts in which they occur (Atun 2012). A 'one size fits all' approach would be impractical in giving recommendations for improvement. It is hoped that the analysis presented in this chapter provides a rapid assessment overview of prerequisites for strengthening HIS and HRH across Africa with relevance to the SDG 3 targets.

11.2 Review of Key Health Information Systems in Africa with Implications for SDG 3 Achievement

Health information systems (HIS) constitute the evidence base that drives health-related decision-making across all six health system building blocks. HIS generate, collate, synthesise and disseminate data into meaningful information

that is used for policy making, governance, research, health education and training, financing, service delivery and human resources development (WHO 2010). A good HIS is able to generate reliable, comparable, complete and timely data on health determinants, health status and health system performance (WHO 2007). Poor outcomes in health care have been attributed to weak HIS (Bailey et al. 2017).

11.2.1 Civil Registration and Vital Statistics (CRVS)

Civil registration and vital statistics (CRVS) systems document major or vital events of populations and provide data on key events such as live births, deaths, marriages and divorce. Sound CRVS are permanent, regular, compulsory and complete in order to adequately monitor population dynamics, evaluate health programmes and identify health inequities. Most CRVS systems in Africa lack adequate data that can be useful in health policy planning due to poor coverage and existing inequalities (Mbondji et al. 2014; Bhatia et al. 2017).

Africa has disproportionate mortality rates for children under-5 years, with the highest mortality rates documented in ten Sub-Saharan Africa (SSA) countries (Liu et al. 2016). Notably, these high burden areas have inadequate CRVS systems to establish childhood and maternal causes of death and, usually, rely on verbal autopsies (VAs) to fill data gaps (Liu et al. 2016; Congo et al. 2017). VAs are not fully reliable, consisting of interviews to ascertain probable cause of death in the absence of a physician. However, VAs can be adapted for regular integration to CRVS, through information technologies such as mobile phones for data collection (de Savigny et al. 2017). Tackling the major under-5 mortality causes (birth complications, perinatal-related events, pneumonia, malaria and diarrhoea) requires vital registration data. African countries can prioritise financial, human and structural resources to improve childhood cause of death data collection methods through alternative methods. These would include the use of household surveys, demographic surveillance networks and pilot registration systems before implementation of fully fledged CRVS.

11.2.2 Surveys

Health surveys are used for rapid data collection to monitor population health needs at single time points and over time. Household surveys remain the most popular source of data within the WHO African region, with Demographic and Health Surveys (DHS) that collect large-scale nationally representative health, nutrition and population indicators being widely conducted (Mbondji et al. 2014). Although DHS have facilitated a wide range of research such as investigating inequalities in accessing antenatal care and neonatal mortality (Neal et al. 2016; Grady et al. 2017) such data is unsuitable for regular monitoring and evaluation because they generate average estimates over five year intervals before data is collected (Amouzou et al. 2013) and are subject to bias due to retrospective reporting.

Survey data can however be easily integrated into global data sharing platforms, and are readily augmented to data obtained from other sources, such as registers and other studies (Lamri, Gripiotis and Ferrario 2014). Retrospective data collection is commonly conducted through surveys of medical records in health facilities (Mwinga et al. 2015). Health facility data could also be used in conjunction with population survey data to improve estimates (Amouzou et al. 2013). Such shared data repositories facilitate easier access to data on SDG 3 targets that potentially lack adequate epidemiological information within countries, for example, target 5 on substance abuse (Ferreira-Borges et al. 2015).

11.2.3 Disease Registries

Disease registries involve facility- or population-based data collection on specific conditions and allow follow-up on management practices and patient outcomes. Some African countries have

implemented registries; mostly focusing on non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes and cancer (Brown et al. 2014; Kingue et al. 2016; Ghorbanoghli et al. 2017). North African countries demonstrate a higher frequency of implementing registries (Bonaventure et al. 2017). Longitudinal observational cohorts are required for long-term investigations to improve management of increasing incidence of NCDs in Africa. Studies on disease registries that harness data for epidemiological investigations are necessary (Moustaghfir, Haddak and Mechmeche 2012).

SDG 3 target 3 reflects the ongoing efforts to curb communicable diseases. An electronic TB register that captures treatment data at the sub-district level and is aggregated at provincial level, has allowed detailed assessment of mortality rates and factors affecting adherence to medication in TB patients (Heunis et al. 2017). Incomplete data and limited financial and human resources impede the full exploitation of registries in studying disease. Integration of non-health facility registries and hospital registry data is recommended to improve data completeness (Chichom-Mefire et al. 2017).

11.2.4 Electronic Medical Records

Electronic medical records (EMR) provide comprehensive patient data that improves health care service delivery and fosters best practice within health facilities. They offer robust integrated health management information sources that can be easily harnessed for research and are largely adopted in developed countries (Pantalone et al. 2017). Despite EMR being recognised as a key health system-strengthening component (Iyer et al. 2017), their wide-scale use in SSA has not been achieved. This has been attributed to several barriers that include high purchase and maintenance costs, poor electricity and Internet connections, inadequate computer skills and non-prioritisation of EMR usage owing to other challenges such as civil unrest and disease outbreaks in many African settings (Odekunle et al. 2017). Poor regulation and governance frameworks have led to inadequate EMR implementation and missed potential benefits (Ahanhanzo et al. 2016).

A few studies in Africa have demonstrated the potential impact of EMR in improved data management efficiency. Application of EMR as part of an intervention facilitated: improved HIV diagnosis and linkage to care among mothers and children, reduced loss to follow-up, wider treatment coverage and lower mother to child HIV transmission (Gamell et al. 2016). EMR allowed rapid initial identification of cancer patients lost to follow-up in primary care to update their vital status (Semeere et al. 2017). The use of open source EMR software has been common in SSA due to concerns with the high cost of proprietary software, with several African countries using the Open Medical Record System (OpenMRS) (Aminpour et al. 2014) mostly within HIV control programmes (Akanbi et al. 2012).

Engaging leadership, training users, establishing multidisciplinary teams, routine quality assessment of data, software upgrades and ensuring availability of adequate power could address these challenges. There is an urgent requirement for EMR that are cost-effective and customised to local contexts, and built to address various health conditions apart from HIV. A phased-in incremental approach to EMR implementation can improve use and uptake by African countries. The potential role of humanitarian-technology collaborations through adapting existing EMR systems to solve emergency disease outbreaks could be considered (Jobanputra et al. 2016).

11.2.5 Surveillance Systems

Surveillance systems remain an urgent prerequisite in the continent given recurring epidemics such as the recent Ebola outbreak in West Africa (Save the children 2015). Rather than regarding surveillance solely as a data source, it can be viewed in a broader context as a specific manner of managing and using data that is obtained from different sources to facilitate timely response to

emergencies (WHO 2007). A public health surveillance system is able to integrate data from the population and facility level to identify and tackle health problems in a timely manner as well as allow planning for long-term disease control strategies (WHO 2007).

Demographic and health surveillance systems (DHSS) have been used across Africa (Ye et al. 2012). They allow for the description of health status in geographically defined populations through the use of surveys. Such platforms help identify geographical inequalities in health determinants; a relevant agenda stated in SDG 3 target 7 on universal coverage (Sousa-Figueiredo et al. 2012). DHSS could be useful to generate population-level data to inform national health priorities (Ye et al. 2012).

11.3 Human Resources for Health and Their Role in Building Reliable Health Information Systems

An effective health workforce should have personnel that are qualified, motivated, productive, adequate and equitably distributed (WHO 2007); achieving best outcomes possible, given available resources and circumstances (Manyazewal 2017). SDG 3 target 12 aims to increase health financing, recruitment, development, training and retention of the health workforce in developing countries. Without an able workforce, inputs into establishing good health information systems (HIS) for achieving SDG 3 are inevitably reduced (WHO 2017).

11.3.1 Factors Impeding Health Worker Education, Performance and Coverage

Although health workers positively regard the benefits of HIS for health care delivery, inadequate knowledge, skills and user-confidence hinder their use of such products to enhance the quality of care (Yagos et al. 2017). Health workers are also strong linkage points of information dissemination, thereby influencing the extent to which health information is used in communities (Flora et al. 2017). This necessitates the need for training interventions that could increase knowledge and motivation on data collection and use. There is evidence to support the application of training and continuous professional development of health workers as a strategic approach to realise SDG 3, by including training in multifaceted interventions to improve health worker performance (Abuya et al. 2015).

The role of interpersonal relationships between patients and providers should be prioritised as these could affect universal coverage of interventions, including health information dissemination. For example, negative interactions characterised by hostility and insufficient guidance on medication use by service providers (Hendrickson et al. 2016) have been reported to erode patients' trust in service providers leading to patients' alternative health-seeking behaviours (Topp and Chipukuma 2016).

Another key area for consideration for African countries is in establishing human resource information systems (HRIS) to enable better planning and management of health workforce resources. HRIS can be used to document characteristics, distribution and compensation in workforce and ensure equitable resource allocation (Likofata Esanga et al. 2017). Health worker availability is subject to correct placement of appropriately trained health workers (Ambikile and Iseselo 2017) and higher health worker densities are associated with lower mortality (Farahani et al. 2016).

Understanding factors influencing health worker performance is crucial to strengthen health systems in Africa. Behavioural factors such as post-training non-adherence to practice guidelines (Steinhardt et al. 2015), poor understanding of management practices of diseases (Gies et al. 2017) and inadequate knowledge on disease control policies (Ganfon et al. 2017) should be investigated as they could influence HIS usage (Nicol et al. 2013).

Health worker shortages, lack of coordination and inadequate financial resources are reported to

compromise quality control and accountability for training programmes and thereby negate their effectiveness and sustainability (Ferrand et al. 2017). Lack of health worker training, poor financial investment, poor governance and weak disease surveillance systems are major hindrances to the elimination of vaccine-preventable diseases (Gaafar et al. 2003).

It is prudent to rethink how to resolve HRH constraints in post-conflict areas in Africa. Civil unrest is detrimental to health systems, and a common occurrence within Africa. Conflict reduces the number of health workers and has adverse implications on the skills, motivation and overall productivity of the workforce (Witter et al. 2016), with great implications for data collection and use.

11.4 Conclusion

African countries have a unique opportunity to meet SDG 3 by improving their health information systems and human resources for health. Cross-cutting implementation strategies for acquiring and disseminating health information that leverage available resources can address multisectoral SDG 3 and other SDGs. Integrating existing data collection methods or sharing platforms to supplement incomplete data and improve the usefulness of information is key and there is need to establish HIS that facilitate application of longitudinal cohorts to tackle SDG 3 targets such as NCDs. African governments should rethink policies that ensure availability and channelling of national level funding towards broadening the scope and coverage of HIS beyond more renowned communicable disease programmes.

Good governance will be crucial in improving financial investments towards the establishment of diverse, devolved, robust data sources and collection of reliable and timely data. Health personnel require training in HIS use and provider–patient interactions as well as determinants of health worker performance even in conflict areas, should be considered for universal coverage in health information dissemination. African governments will need to be proactive, increase investments in and take ownership of local funding initiatives to build reliable information systems and educated health personnel towards achieving sustainable health.

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12 Prioritising Women's Mental Health for the Achievement of the SDGs in Africa

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Abstract

Mental health has been explicitly included in the United Nation's global sustainable development agenda for the first time within the new Sustainable Development Goals (SDG) under the third SDG, 'Good health and well-being'. In this chapter, we argue that prioritising the mental health of women in Africa is central to achieving this and several other goals. We outline the adversities faced by women on the continent and highlight some of the opportunities that may arise by focusing on the mental health needs of women. We describe one ongoing multinational project, the PRogramme for Improving Mental healthCarE (PRIME), as an example of a collaborative endeavour to scale up the delivery of mental health services at primary care level in Low- and Middle-Income (LMI) countries. With a view to aligning the SDG and Global Mental Health agenda, we review the evidence for one innovative intervention in the form of cash transfer programmes, giving special attention to their impact on the mental health and well-being of women. Finally, we propose novel approaches to integrating development programmes with mental health interventions, including indicators that better explain the complex relationship between gender, poverty and mental health.

Keywords

Mental health · Empowerment of women · Cash transfer programmes · Poverty

12.1 Introduction

The adoption of the Sustainable Development Goals (SDG) resolution in 2015 saw mental health included explicitly in the United Nation's global development agenda for the first time (UN 2015). The third SDG, namely, 'Good health and well-being', includes three targets that directly address global mental health concerns:

- Target 3.4 aims to, 'By 2030, reduce by one third premature mortality from non-communicable diseases through prevention

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and treatment and promote mental health and well-being'.

- Target 3.5 seeks to 'Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol'.
- Target 3.8 encompasses the endeavour to 'Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all' (UN 2015).

The inclusion of mental health in the 2030 agenda is a significant step forward for the Global Mental Health movement. Good mental health is integral to the healthy functioning of both individuals and the societies they constitute, and so is central to the achievement of several SDGs, not just SDG 3 (Votruba et al. 2014). Consider, for example, SDG8, which seeks to 'promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'. Data from the 2013 Global Burden of Disease Study showed that mental and substance use disorders are the leading cause of Years Lived with Disability (YLDs) (Whiteford et al. 2013), accounting for 21.1% of all YLDs and 11% of all Disability-Adjusted Life Years (DALYs) (Global Burden of Disease Study Collaborators 2015). This clearly represents a barrier to the achievement of sustainable economic growth with productive employment for all.

Yet mental health is also important for other reasons, as it intersects with many other global development priorities. The link between poverty, inequality and poor mental health has consistently been demonstrated (Lund et al. 2010). Research has shown that the relationship between poverty and mental disorders is both complex and circular (Lund et al. 2010). On the one hand, the social causation hypothesis contends that conditions of poverty, such as stress, negative life events, generally poorer physical health, and inadequate access to health care, all serve as precipitants to Common Mental Disorders (CMD). On the other, the social drift hypothesis holds that people with mental disorders are likely to drift more easily into conditions of poverty due to increased health expenditure, reduced income or unemployment (Lund et al. 2010). In their longitudinal analysis of poverty and depression in a nationally representative South African sample, Lund and Cois (2018) showed that social causation and social drift act simultaneously in the relationship between poverty and depression; findings that underscore the economic implications of CMDs (Lund and Cois 2018).

In South Africa alone, the loss of income for individuals living with CMDs has been calculated at US$4,798 annually, amounting to a total annual cost of US$3.6 billion (Lund et al. 2013). In Ghana, mild or moderate psychological distress has been found to account for lost productivity that amounts to 7% of the country's gross domestic product (Canavan et al. 2013). For the largely low-income countries of Africa, this represents a major obstacle to economic growth and productivity, especially when mental health expenditure is frequently less than 2% of total health expenditure (WHO 2015a, b). Where High Income (HI) countries' average annual expenditure on mental health is US$50 per person, LMI countries spend an average of US$2 per person annually (Chisholm et al. 2016). In their global return on investment analysis, Chisholm et al. (2016) found that scaling up effective treatment for the period 2015–2030 would require an investment of US$147 billion but would yield significant and substantial returns. Over that period, 43 million healthy life years would be added, at an economic value of US$310 billion. Furthermore, economic productivity gains would amount to US$230 billion for scaled-up depression treatment and US$169 billion for anxiety disorders. This represents a cost-benefit ratio of US$2.3–5.0 for every US$1 spent when only economic benefits are considered, but US$3.3–5.7 when the value of health returns are included (Chisholm et al. 2016).

In this chapter, we show that women in Africa are particularly vulnerable to the adversities

associated with the cyclical relationship between poverty and mental health. We focus on the intersection between women's mental health and the SDGs, and argue that prioritising the needs and opportunities associated with women's mental health in Sub-Saharan Africa (SSA) will optimise efforts to achieve SDG 3 as well as several other SDGs for the continent, including, 'Gender equality' (SDG 5); 'Reduced inequalities' (SDG 10); along with SDG 1, 'No poverty' and SDG 2, 'Zero hunger'. First, we outline the rationale for prioritising women's mental health as a means of achieving several SDGs. Second, we discuss several innovative mental health interventions incorporating a focus on women's mental health. Finally, we consider the ways in which the development agenda and global mental health research might be aligned to promote sustainable development in Africa through integrated programmes and improved indicators of progress in women's mental health.

12.2 Giving Priority to Women's Mental Health in Africa

The rationale for attending to women's mental health can be captured in two overarching premises: need and opportunity.

12.2.1 Need: Adversities Faced by Women in Africa

Women in Africa face a range of grave and complex intersecting challenges that affect their mental health and well-being. Fuelled by poverty and gender inequality, these adversities include gender-based violence, less or poorer quality education and higher rates of HIV infection (McFerson 2010; Ramjee and Daniels 2013). Despite comprising half of the global population, women represent 70% of the world's poor (Moghadam 2005). Research has also shown that women in Africa bear the brunt of poverty and its effects (USAID 2015). McFerson (2010) contends that the interaction between gender discrimination, civil conflict and curtailed asset ownership rights, is the primary reason for greater poverty among women. For example, despite undertaking a majority of agricultural work, women only own about one-fifth of agricultural land (Lombe et al. 2014). Furthermore, in traditional patriarchal settings where unpaid care work is the domain of women and the control of economic resources is left to men (Lombe et al. 2014), women are often unable to exercise economic decision-making (USAID 2015).

Women in Africa endure a range of other adversities associated with poverty and gender inequality. Almost three-quarters of people who are infected with HIV reside in SSA (Ramjee and Daniels 2013) and of those, almost two-thirds are women or girls (Watts and Seeley 2014). Gender inequality and Intimate Partner Violence (IPV) have been identified as among the central structural determinants of vulnerability for HIV infection (Watts and Seeley 2014). One study analysed data from 141 studies across 81 countries to estimate the global lifetime prevalence of intimate partner violence (Devries et al. 2013). It found that, globally, 30% of women or girls over the age of 15 would experience physical and/or sexual violence in their lifetime. However, rates across some parts of Africa were higher: 66% in Central Africa, 39% in East Africa, and 43% in West Africa (Devries et al. 2013).

These intersecting factors leave low-income women particularly vulnerable to psychological distress (Patel et al. 1999), and at high risk for the development of CMDs. Indeed, using data from the WHO's World Mental Health Surveys Initiative, Seedat et al. (2009) found that across all cohorts in all 15 participating countries, women were between 1.3 and 2.6 times more at risk across their lifetime for the development of unipolar mood disorders and all anxiety disorders, compared to men (Seedat et al. 2009).

Female gender, low education and poverty have also been found to be highly associated with CMDs, according to one review (Patel and Kleinman 2003). In this review, a low level of education was found to be the most consistent association between poverty and mental illness (Patel and Kleinman 2003). This link becomes significant when considering that several studies

have shown that girls drop out of school earlier than boys for several reasons, including gender-based violence on the way to school or at school; a lack of sanitation facilities for girls when they are menstruating; and the burden of unpaid care work in the home (Stuart and Woodroffe 2016). In SSA the quality of education for girls is also more likely to be inferior compared to education for boys (Fredman, Kuosmanen and Campbell 2016). Furthermore, Wilkinson and Pickett (2010) have argued that—more than absolute poverty—relative poverty, in the form of income and social inequality, is responsible for high prevalence rates of mental disorders. Of the ten most unequal countries in the world, seven are found on the African continent (World Bank 2015). Women are thus doubly at risk: first, by poverty and then by income inequality. Given the disabling effects of CMDs, the economic implications for women and their families are grave, potentially perpetuating a cycle of poverty (Lund et al. 2011).

12.2.2 Opportunity: Accessibility and Reach of Women-Targeted Interventions

Traditionally, mental health services have existed in specialist institutions, such as asylums, that are frequently separate to other medical services. However, the WHO's response to the significant mental health treatment gap in LMI countries (Thornicroft 2007) was to advocate for the deinstitutionalisation of mental health care so that services are located where they would be most accessible: at primary care level within communities (WHO 2007). One response was seen in increased studies investigating task sharing mental health interventions that are integrated into general primary care services (Chibanda et al. 2016), reproductive and child health (Rahman et al. 2013) and chronic care (Petersen et al. 2014).

In considering the implications of these developments in public mental health for women, several opportunities come to mind. Women are more likely to seek out medical and mental health services for themselves and are likely to do so significantly sooner than men (Thompson et al. 2016). Women also tend to speak to healthcare providers more readily about mental health problems (Thompson et al. 2016). Where primary healthcare services are available in the form of perinatal or reproductive services, coverage rates among women are often high (Honikman et al. 2012). As such, integrated mental health interventions are able to reach more women. Furthermore, given that women frequently assume informal caretaking roles, mental health interventions aimed at women may also indirectly improve the well-being of those for whom they are traditionally the primary caretakers.

Focusing on women's mental health provides important opportunities to empower women, extending the reach of mental health programmes to contribute to the fulfilment of other SDGs, including 'Gender equality' (SDG 5); and 'Reduced inequalities' (SDG 10). Furthermore, the bidirectional links between poverty and women's mental health have important implications for the ways in which interventions might facilitate the achievement of the targets for SDGs 1 and 2.

12.3 Collaborations on Innovative Interventions Attending to Women's Mental Health

Many promising mental health research projects have emphasised women's mental health in Africa but, until recently, collaborative research endeavours have been few. We will describe two multinational collaborative programmes that incorporate interventions for women: PRIME and AFrica Focus on Intervention Research for Mental health (AFFIRM).

12.3.1 The Programme for Improving Mental Health Care (PRIME)

PRIME is an ongoing DFID-funded multinational research consortium operating in five LMI countries: South Africa, Nepal, India, Ethiopia and Uganda (Lund et al. 2012). PRIME was designed to generate high-quality evidence for scaling up mental health interventions in primary healthcare settings in LMI countries. With an eye to effective collaboration between a range of players, a key objective was to develop inter-sectoral partnerships between academic institutions, NGOs and government ministries of health (Lund et al. 2012). The programme identified priority mental health conditions including depression, alcohol use disorders, schizophrenia and epilepsy; targeting key marginalised groups including women and people living in poverty (Lund et al. 2012).

District mental healthcare plans were developed for each site to address needs at three levels: the healthcare organisation, the health facilities and the community (Lund, Tomlinson, and Patel 2016). The content of each package was site-specific, developed in consultation with local partners (Lund et al. 2016). Designed to serve as mental healthcare frameworks for primary care integration in each country, the plans comprised of innovative interventions with the most sound evidence base at each structural level (Hanlon et al. 2016), as put forward by the WHO's (2016) *mental health Gap Action Programme Intervention Guide* (m-hGAP-IG) (Hanlon et al. 2016).

To varying degrees, all the mental healthcare plans incorporated interventions concerned with detection or management of problems particular to women. While detecting IPV was specifically highlighted in some cases (Fekadu et al. 2016), interventions for women most frequently targeted perinatal mental disorders. There are several reasons for focusing on women during this period, including, the high prevalence of perinatal mental disorders (Fisher et al. 2012), and the associated adverse effects (Gelaye et al. 2016); and the access that perinatal health services provide, to a larger number of women (Byatt et al. 2015). While all five district plans identified maternal depression as a prioritised condition and all except one (South Africa) provided some form of explicit training about detecting and treating these disorders, two specifically included interventions that directly address perinatal CMDs. The Nepalese arm of the project employed the mh-GAP's *Thinking Healthy* (WHO 2015a, b) intervention. A group of health workers were trained specifically to deliver this cognitive-behavioural intervention to address maternal depression (Jordans et al. 2016). Similarly, in India, mental health case managers were recruited to screen mothers for depression and alcohol use disorders and to provide psychosocial intervention (Shidhaye et al. 2016). In Uganda, a psychological intervention was delivered for perinatal depression, in conjunction with a local non-governmental organisation providing counselling for victims of IPV (Lund, personal communication 2018). Evaluations of the various interventions are forthcoming.

12.3.2 Africa Focus on Intervention Research for Mental Health (AFFIRM)

AFFIRM's overarching goal is to improve the delivery of cost-effective mental health interventions to reduce the mental health treatment gap in SSA (Lund et al. 2015). Among its primary aims are examining the feasibility, acceptability and cost-effectiveness of task shifting interventions by conducting RCTs in Ethiopia and South Africa; and to translate research knowledge into policy and practice by establishing a collaborative network of researchers, NGOs and government agencies (Lund et al. 2015).

While the Ethiopian arm of the intervention research component is concerned with improving access to care for people with serious mental disorders, the South African arm is focused on determining the effectiveness and cost-effectiveness of a task shifting intervention to treat perinatal depression (Lund et al. 2015).

Women attending one of two antenatal clinics in the Western Cape province are screened for depression at their first antenatal visit (Lund et al. 2014). Those who screen positive are randomly assigned to the intervention or to enhanced usual care control. Six community health workers are responsible for intervention delivery. The intervention comprises six sessions of approximately one hour in duration and incorporates a range of evidence-based psychotherapy components. In addition to usual care, control group participants receive monthly phone calls from two independent community health workers, for 3 months. These calls are focused on enquiring about participants' general health, life and sources of support, and detecting suicidal ideation. The results of the study are forthcoming.

12.4 Aligning the SDG Agenda and Global Mental Health Research

Aligning the agenda for sustainable development in Africa with the objectives of the Global Mental Health movement might be approached in two primary ways: first, broadening mental health research to incorporate novel interventions to address a range of socio-economic challenges that impact women's mental health and well-being, and second, developing indicators and mechanisms to measure progress that are not limited to specific domains.

12.4.1 Innovative Intervention Possibilities

One of the roles that the Global Mental Health movement might play in the achievement of SDGs, especially for women, would be in extending its reach beyond mental illness to include psychological well-being and empowerment. Directly addressing some of the social ills that women face is paramount to attaining both global mental health and sustainable development. Furthermore, accepting the multidimensional conceptualisation of poverty and the complexity of the relationship between poverty and mental health necessitates a broader view of mental health interventions in LMI countries (Burns 2015). To this end, there are several promising and innovative approaches to intervening. Our focus is on one such innovation, namely, cash transfer programmes, which have shown significant potential to empower women financially and improve their overall well-being (Fielding and Lepine 2017).

To date, research on cash transfer programmes has included a wide range of outcomes to measure their impact, including poverty alleviation (Hodges et al. 2013), school attendance (Robertson et al. 2013), and reduction in HIV infection rates (Pettifor et al. 2016). Several systematic reviews of data from LMI countries have shown that cash transfers improve the uptake of health services and increase healthy behaviours (Lagarde, Haines and Palmer 2009; Ranganathan and Lagarde 2012). Several studies have also shown that, on average, cash transfers made to women benefit children more than when made to men (Lim et al. 2010).

Data supporting the mental health benefits of cash transfer programmes is promising (Lund et al. 2011). A study in Kenya found a 24% reduction in odds of depressive symptoms among young people living in households that received cash transfers (Kilburn et al. 2016). Also in Kenya, Shangani et al. (2017) found that orphans and vulnerable adolescents living in households that received cash transfers were significantly more likely to have a positive outlook on the future, less likely to be anxious and less likely to have post-traumatic stress symptoms. Haushofer and Shapiro (2016) also found substantial increases in psychological well-being and reductions in cortisol levels (a measure of stress) among a Kenyan sample as a result of a large, once-off, unconditional cash transfer. A South African study found that people who received child support grants for some or all of their children had 60% and 84% lower odds, respectively, of having a CMD, compared to those who did not receive any child support grants (Plagerson et al. 2011). Another South African study found that child support grants reduced the

impact of a depressed parent on adolescent mental health (Eyal 2016), while in Mexico, the large-scale *Oportunidades* cash transfer study found a reduction in child behavioural problems, including aggression and oppositional behaviours (Ozer et al. 2009); an outcome that was shown to have persisted 10 years later (Fernald, Gertler and Neufeld 2009).

Data pertaining to cash transfer programmes and issues concerning women's mental health are extremely limited. One mixed methods study in Ecuador found that their cash and in-kind food transfer intervention led to reduced intimate partner violence by reducing day-to-day stress; improving household well-being; and increasing women's capacity for decision-making, self-confidence and freedom of movement (Buller et al. 2016). A programme in India delivered cash transfers to women who gave birth in government facilities and found that the intervention was associated with a 36% reduction in moderate depression and an 8.5% reduction in continuous scores of postnatal depression (Powell-Jackson et al. 2016). Two notable programmes in Bangladesh have shown that cash transfers increase girls' school attendance (Raynor and Wesson 2006), results that are significant given the association between poverty, mental health and low levels of education (Patel and Kleinman 2003).

There are several ways in which the design of programmes that integrate cash transfers and mental health interventions might prove effective for achieving the SDGs. De Silva (2015) suggests two solutions to this end. First, integrating mental health into existing development programmes. Second, improving the capacity for mental health programmes to promote sustainable development so as to prevent the adverse socio-economic outcomes of mental illness. In the first instance, developing cash transfer programmes might incorporate elements of *mh-GAP*. In the second, cash transfers might be used as an extension to mental health interventions. For example, frequently cited barriers to the attendance of perinatal mental health programmes include the lack of money to access transport to attend the intervention or loss of income due to being absent from work (Nakku et al. 2016). Conditional cash transfers attached to attendance of the intervention might represent a potential solution to those barriers.

12.4.2 Indicators and Measures

The SDG agenda includes two indicators for mental health. Indicator 3.4.2 monitors the suicide mortality rate, while Indicator 3.5.2 is concerned with 'Harmful use of alcohol'. While these indicators provide limited information about some aspects of mental health, they are by no means adequate as measures of progress in the area of global mental health. Furthermore, they offer little opportunity for insight into women's mental health. Including indicators for the mental disorders that represent the greatest burden to society and as a result, the most significant obstacle to sustainable development will be important (Thornicroft and Votruba 2016).

There is a parallel need to develop a research agenda that demonstrates the mechanisms by which mental health interventions might impact other areas of life. In Africa, understanding how improving mental health might reduce poverty and, conversely, how reducing poverty and hunger might improve mental health, is essential to attaining the SDGs on the continent (Lund 2012). To date, mental health intervention research efforts in LMI countries that include economic indicators and development programmes that include mental health outcomes, are limited (Lund et al. 2011). To this end, in the field of mental health, Lund (2014) proposes more clearly delineated poverty indicators that might make it possible to achieve a more nuanced understanding of the complex relationship between poverty, inequality and mental health. For example, socio-economic status in mental health research is often simply reported as 'high/low'. Including more nuanced and precise indicators of income at both household and individual level is essential (Lund 2014).

Furthermore, the inclusion of indicators of inequality in mental health research is similarly essential (Burns 2015). Burns (2015) advocates

for a more sensitive measure of income inequality that clearly shows the distribution of wealth and exposes inequalities within distribution subgroups. Given the gendered nature of inequality, indicators that include markers of multidimensional poverty that are particular to women seem critical. In his study of multidimensional poverty among women in SSA, Batana (2013) identified four dimensions to measure poverty in women: assets, schooling, Body Mass Index (BMI) and empowerment. The empowerment dimension was specifically concerned with women's decision-making powers and freedom of movement (Batana 2013). It is insufficient to limit our exploration of the relationship between poverty, inequality and mental health to income and economic inequality. It is essential that mental health intervention research aimed at women takes factors associated with gender into account and includes indicators that reflect both women's economic and social empowerment.

Where development research is concerned, the inclusion of measures of mental health is just as important. In their review, Lund et al. (2011) propose several strategies to achieve this. First, they highlight the need for the inclusion of locally valid measures of mental health outcomes; screening for specific disorders or groups of disorders, instead of relying on vague and ill-defined constructs, such as self-esteem and stress. Second, they advocate for the use of precise measures of causal mechanisms, for example, delineating the precise conditions for a cash transfer, the intervention volume and factors relevant to the local context (Lund et al. 2011). The inclusion of these indicators will better enable us to understand the interaction between poverty, inequality and mental health.

12.5 Conclusion

In this chapter, we have argued that prioritising women's mental health will optimise endeavours to achieve several global goals. Focusing on women's mental health is important for two reasons: (1) need—there is overwhelming evidence to show that gender inequality leaves women in Africa hardest hit by the effects of poverty, which are strongly associated with mental health problems; and (2) opportunity—focusing on women extends the reach of mental health interventions to more people, both directly and indirectly. We then described two projects that exemplify some of these issues, namely, PRIME and AFFIRM. With a view to aligning the SDGs and global mental health, we proposed two means by which research might proceed: to integrate mental health interventions into development programmes such as cash transfer programmes, and to advocate for the inclusion of sustainable development outcomes in mental health research, for example, by including financial incentives. We have outlined the ways in which more precise and nuanced indicators would enable a better understanding of the complex relationship between gender, poverty, inequality and mental health.

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Talent Management Challenges for Women in South Africa

13

Linda Ronnie and Alison J. Glaister

Abstract

Sustainable Development Goal 5 seeks to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. This is further supported by South Africa's Employment Equity Act of 1998 and its promotion of affirmative action measures designed to achieve a diverse workforce. This suggests a key role for talent management (TM) approaches and, more importantly, the management of female talent in organisations located in South Africa. Through data collected from seven focus group interviews with women across 58 South African organisations, we find little evidence to suggest that organisations are seeking to manage their female talent and/or develop bespoke and exclusive TM practices. When TM initiatives do emerge, they terminate once gender parity is achieved. The result is a myopic and instrumental approach that only breeds further inequity and talented female turnover. Managers should seek to create a long-term focus on talent development and consider the strategic implications of their talent pipelines. Female workers are urged to seek mentors, challenge organisational practices that reinforce 'traditional' segmented approaches, develop their networks and encourage a talent mindset in the workplace.

Keywords

Female workers · Talent management · South Africa · Gendered workforce

13.1 Introduction

Talent management (TM) focuses on the contextual value and differential contributions of specific employees (Glaister et al. 2018; Linden and Teece 2014) and develops 'an advanced' and 'sophisticated' set of supporting Human Resources Management (HRM) policies and practices (Sparrow et al. 2014, p. 51) to achieve value. TM is becoming increasingly important in organisations as they face talent shortages and recognise that contributions from a talented workforce are significant for organisational sustainability and competitive advantage. South African companies are now compelled to become more competitive and productive in a global economy that is becoming increasingly reliant on skilled workers' contributions (Horwitz 2013a). This chapter discusses the TM challenges for women in South Africa and identifies the factors that shape the

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working lives and employment expectations of those women who aspire to leadership positions as envisaged by the Sustainable Development Goals (SDGs). Specifically, SDG 5.5 proposes to 'ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life' (United Nations 2015).

We examine the challenges that working women face alongside the management practices they experience within these organisational contexts and conclude with recommendations for women and their organisations. Our chapter begins by highlighting the importance of TM in competitive business environments and the experience female employees have of TM. We then discuss the role of women in today's workplace, the benefits of gender diversity and prevalent beliefs regarding women's place and contribution in organisations in South Africa.

13.2 Women in the Workplace

Talented employees are those who 'have the willingness and potential to undergo the development to fill key positions with their unique set of skills and competencies and who also promise high performance in these positions' (Böhmer and Schinnenburg 2016, p. 74). They are a key component in national economic development, social upliftment efforts and South Africa's ambition to compete with other emerging economies. Despite this, women remain an underutilised portion of the talent pool (Scullion and Collings 2011) and their empowerment in the workplace has been sluggish. Burke (2017) suggests that organisational culture, along with societal views and cultural values, has been slow to shift.

The benefits of gender diversity include an enhancement of organisational creativity and innovation (Diaz-Garcia et al. 2013) and, significantly, an improvement in overall financial performance of the organisation (Campbell and Minguez-Vera 2007). Tarr-Whelan (2009) argued that there are several reasons for having more women in management roles: less hyper-competition with greater risk awareness, a likelihood of better organisational policies, increased commitment to social responsibility, improved long-term planning, and improved teamwork and participative decision-making practices.

Yet, role expectations or stereotypes influence career decisions for women and their employers. The 'think-manager; think-male' mindset (Schein 2007) explored the belief that men were more likely than women to possess the characteristics associated with managerial success. Even though studies indicate that these views have somewhat declined over time (Duehr and Bono 2006; Koenig et al. 2011), these forms of stereotyping are an impediment to the career progression of women and devalue their work. These beliefs may also result in bias against women in selection for managerial positions, promotion opportunities, and training and development decisions. In addition, Braun et al. (2017, p. 384) explained the notion of a 'sticky floor' that keeps women in follower roles due to their 'communal' traits and argued that the barriers to leadership positions commence before women even contemplate leadership roles. Although women are attempting to break through the glass ceiling, there is a need to shift traditional and gendered views of the managerial role if women are to be offered equal TM opportunities (Ryan et al. 2011).

13.3 Talent Management in South Africa

Research regarding TM in post-apartheid South Africa is highly fragmented. Local studies either do not consider the holistic nature of TM and prefer its various components such as attraction, retention and motivation (Olckers and Du Plessis 2015; Schlechter et al. 2015) or they broaden the TM discussion to include aspects such as training and development, compensation, performance appraisal, labour relations, communication and culture (Grobler and Diedericks 2009). Despite this empirical drawback, these and similar studies show a general underdevelopment of formal, locally relevant TM practices. This appears consistent with the development of HRM in general and the difficulties in identifying indigenous

African HRM models (Kamoche 2002). Several scholars acknowledge a common philosophical and cultural trait across the continent as 'ubuntu'; a communal humanism characterised by hierarchical and relational networks of mutual obligations and interdependency (Kamoche et al. 2012; Horwitz 2013a). These emphasise collectivist and paternalistic practices over instrumental individualism (Horwitz 2012, 2013b). This suggests that addressing SDG 5 through TM challenges conceptualisation and implementation of TM to respond to specific cultural idiosyncrasies.

Further, the assumption that TM assists gender equality is problematic if we assume a focus on an exclusive subset of the workforce. Exclusivity naturally breeds inequity, and meritocratic ideologies fail to take into account the systemic inequalities embedded within societal structures. These societal structures shape stakeholder expectations of women's working lives and their experience of the workplace (Noon 2010; Baker and Kelan 2017). The 'ideal' employee tends to be a gendered, classist and racist construct (Tatli et al. 2013). While this may be a critique of exclusive forms of TM, inclusive measures can be taken within this approach and can indeed offer a sustainable, stakeholder approach to workforce management that creates a range of positive externalities and can help support a country's economic development (Thunnissen et al. 2013; Keller and Cappelli 2014). South African female-oriented TM strategies can also support existing legislative measures including the Employment Equity Act (Republic of South Africa 1998).

13.3.1 Legislative Measures: Redress and Employment Equity

The implementation of employment equity legislation seeks to redress past racial and gender imbalances. According to the Employment Equity Act, all organisations are legally required to promote equal opportunities and implement affirmative action measures. Compliance with legislation requires targets related to the recruitment, retention, training and development of designated groups defined as black people (including Africans, Coloureds and Indians), women, and people with disabilities. A key objective of the Act is to achieve a diverse labour force; it therefore provides a measure of support for SDG 5 in assisting women's full and effective participation in the workplace at all levels. Although this is encouraging, positive employment practices must support the implementation of legislation as envisaged in the Code of Good Practice: Human Resource Policies (Republic of South Africa 2005) including a regular analysis of the workforce, a review of HR policies and procedures, an analysis of the working environment and surveys to gauge employee experience of diversity management within the organisation. These audits should analyse the barriers faced by black people, women and people disabilities vis-à-vis their recruitment, promotion, advancement and retention. According to Statistics South Africa (2017), gender inequalities remain, and this is especially the case in terms of female career progression.

13.3.2 Progression of Women in the South African Workforce

South African women comprise 45.3% of the economically active population (Statistics South Africa 2017). However, while women outnumber men in completing tertiary education (men = 1, 92 million; women = 2,04 million), these figures do not manifest in the employment arena (Statistics South Africa 2017). Table 13.1 shows the breakdown across gender in various employment categories for the private and public sectors including non-profit organisations and educational institutions (Table 13.1).

The following observations can be made from the Commission for Employment Equity (CEE) reports over the 3-year period 2014–2016:

- Professionally qualified and skilled technical levels

At the professionally qualified and skilled technical levels, gender representation between male and

Table 13.1 Workforce profile for private and public organisations by gender (Commission for Employment Equity (CEE) Annual Report 2016–2017)

Category	Male	Female
Skilled technical[a]	54.0% of which: 65% African 20% White	46.0% of which: 58% African 19% White
Professionally qualified[b]	54.4% of which: 46% African 43% White	45.6% of which: 40% African 30% White
Senior management	66.7% of which: 42% African 63% White	33.3% of which: 24% African 33% White
Top management	69.2% of which: 43% African 76% White	30.8% of which: 23% African 24% White

[a]Skilled technical and academically qualified/junior management/supervisors
[b]Professionally qualified and experienced specialists/mid-management

female groups appears to be somewhat more closely aligned to the economically active population distribution and this trend is likely to continue.

- Senior management level

When analysing staffing practices at the senior management level, it is evident that males seem to enjoy preference in employment opportunities at the senior management level. Female representation at this level remained largely unchanged at just above 30% for the past 3 years. Equitable representation of women at this decision-making level is highly unlikely given this trend.

- Top management level

At the top management level, white males are afforded higher levels of recruitment promotion opportunities as compared to other groups. Female representation in top management remains static and low at just over 20% for the last 3-year period. The lack of an equitable representation of women at this strategic level is likely to have an adverse effect on the equitable representation of women at other occupational levels. Overall, the data, gathered from 26,255 organisations' employment equity reports, indicate that discriminatory barriers to women's progression continue to exist within the workplace.

Gender discrimination within certain professions is rife (Barkhuizen et al. 2012; Bowen et al. 2013). Research in the manufacturing sector shows limited career progression for South African women, including lack of equity in promotion, training and pay. This is evident in Du Plessis and Barkhuizen's (2015) finding that women engineers face a multitude of barriers, including lack of mentorship, few training opportunities and minimal career opportunities. As Thusi (2014) argued, despite the active commitment of many South African organisations to encourage the career advancement of women, these strategies lack clear measurement and monitoring frameworks and render their impact unknown. The success of TM initiatives for women is therefore still unclear even when programmes are implemented as a strategic imperative.

13.4 Organisational Realities: Experiences of Women in South African Organisations

As an attempt to examine the challenges faced by women in the workplace and the reasons for their limited career progression, we conducted seven focus group interviews in 2017 with women from 58 South African organisations. The organisations ranged from small (between 250 and 500 employees) to very large (over 45,000 employees). The women in the focus groups were aged between 26 and 41 years. Eighty-three percent of

the group held postgraduate qualifications across various disciplines such as commerce, social sciences, marketing, business science, law and science. Nine percent of the women held Master's degrees in economics, engineering, accounting and science. All were employed as technical specialists or held junior, middle or senior management roles in retail, agriculture, hospitality, consulting, advertising, financial services, energy, petroleum and manufacturing companies. Our focus group discussions prompted four inter-linking themes regarding the challenges faced in the working environment.

13.4.1 Formal and Targeted Programmes for Women

None of the women reported TM programmes for women within their organisations. Where talent programmes existed in organisations, these were mainly targeted at both male and female black employees. In light of South Africa's attempt at racial redress this may not be surprising. Participants suggested that the lack of women-focussed TM programmes ensured that women were not singled out within the company or treated 'differently' to their colleagues. Yet, TM assumes differential treatment of a select cadre. The need to actively avoid differential treatment of women shows a lack of appreciation of the affirmative action component of the legislation that condones positive discriminatory practices when seeking redress. One very large company had rolled out a women's TM programme but this had been discontinued when gender parity had been achieved within the organisation. In smaller organisations of less than 100 employees, there was no evidence of TM measures due, in part, to lack of financial resources.

13.4.2 Organisational Culture and Female Roles

The overall culture of the organisation determined the managerial interest in women's development and growth. The legacy of apartheid meant that white men dominated leadership roles and shaped culture. Little consideration was paid to how women might be supported in alternative ways. Although there were fewer issues around hostile gender discrimination, there were instances of implicit discrimination regarding the structure of career paths and the lack of female role models. Women felt that there was limited scope for diversity of thinking, acting and leading and that the only way to advance was to conform to what was essentially a traditional approach. Anything else was perceived as weak or insufficient to get the job done.

Women experienced a bias in the roles they were expected to play—administrative and support staff were predominantly female and once women excelled in these roles, they were typically not moved upward. When women were moved to more senior roles from their technical specialist role, these roles represented a lateral move only. At one company when a CEO was questioned whether he would consider a man in the lateral role, he merely brushed off the suggestion. In another example, a CEO targeted recruitment of women as he was more impressed with the calibre of female applicants and considered them hard working and disciplined, yet their roles within the company were limited to supporting functions. Women in the focus groups complained that many decisions related to strategy and their company's future were made during informal male get-togethers during smoke breaks and after-work activities that typically excluded women. Female managers were wary of their male counterparts as they were distrustful of the ties and possible alliances created during these unofficial events with senior executives.

13.4.3 The Glass Ceiling

Between 2000 and 2012, the International Labour Organisation (ILO) (2015) reported that the percentage of women in managerial positions in South Africa had increased by over 5% between 2000 and 2012. In 2017, although 19.1% of directors were female, only 4.7 and 6.9% of CEO

and chairperson positions, respectively, were held by women in JSE listed companies (Business Women's Association South Africa (BWASA) 2017). Black women board directors in state-owned enterprises increased from 495 in 2010 to 608 in 2012 (ILO 2015). However, the ILO (2015) highlighted continuing inertia, proclaiming that the glass ceiling for female workers remains with a series of glass *walls*—where women tend to be segregated into specific managerial roles, namely, HR, public relations and administration. In the organisations surveyed in our focus groups, there was no predetermined or clear path for growth and progression of women. It was left to women to assert themselves in terms of career opportunities. In one of the medium-sized companies, nearly 60% of the staff were women, yet most of the senior roles were occupied by men. In 6 of the 11 large organisations, a limited number of women were on the executive. The 'old boys' club' was still apparent within these, often large, multinational companies. Where women had reached senior roles, the majority were either single, childless or had partners that worked similarly long hours. Where women encountered barriers to progression, they reported feelings of frustration, depression and boredom. This ultimately translated into exit from their organisations as ambitious women were more likely to look elsewhere for meaningful and fulfilling work.

The lack of suitable female role models and mentors remains a key challenge to female TM and progression. Younger female professionals wish to be inspired by women in senior leadership, not only for their own development, but so that they could fulfil a mentorship role for other women in the future. The lack of role models created a perception of little interest in women's progression throughout the organisations. One organisation was reported initiating a 'Women in Leadership' mentorship group where senior female executives would provide helpful tips on career progression and act as inspirational beacons to other women in the organisation, but the programme had been discontinued as gender parity had ostensibly been achieved. This meant that new female entrants to the organisations were denied similar opportunities.

13.4.4 Balancing Work–Life

Working women in our study often fulfilled the role of primary caregiver which, in turn, gave rise to their inability to focus completely on work responsibilities. There was a challenging dualism that these women needed to balance between being a 'good/involved' mother and a 'good/engaged' employee. Recently married women, women who lived in extended family settings and women with young children often struggled. However, while they threatened to quit their posts on several occasions, this rarely resulted in actual turnover due to financial considerations. The situation of women taking maternity leave affected women's job roles in some instances. Although their jobs were guaranteed after returning to the company, they could lose their specific past roles and return to another position available at that time. In most cases, this 'sideways movement' proved to be disadvantageous to female returnees.

13.5 Implications and Recommendations

The findings from the focus group sessions reveal several challenges faced by women in South African companies. We make the following suggestions for improving women's roles in organisational life in South Africa to meet the goals implicit in SDG 5.5 around two specific areas: (a) career progression and the representation in senior roles and (b) supportive policies and enabling organisational cultures. The recommendations are three tiered: for organisations, for women and for management educators.

13.5.1 Career Progression and Representation in Senior Roles

- Advice for organisations

Organisations should seek to adhere to the tenets of SDG 5 and enable full and effective participation of women in the workplace at all levels.

Yee (2014) suggests that organisations should consider where women are in the talent pipeline and start to identify barriers, determine which skills they are helping women develop and discard unconscious biases. Organisations need to monitor progression towards specific targets and consider the importance of perceived external organisational prestige (Ribeiro et al. 2016). Organisations that have a reputation for their female TM measures are also likely to attract and retain outstanding women applicants.

Organisations should also appreciate that when women reach senior positions within their ranks, there are often further challenges to be faced. The likelihood of success for senior women executives is increased when women have influence over policymaking decisions, perceive real empowerment through opportunities to advance their goals and priorities and experience a fair and just work environment (Sabharwal 2015). Organisations should also develop clear policies that outline career trajectories for women (Ibeh and Debrah 2011) including the development of succession planning processes, clear promotion criteria, training and development, and executive coaching opportunities (Burke 2017).

- Advice for women

One of the most persistent stereotypes has been to associate management with more masculine attributes (Powell and Butterfield 2017). Yet women are considered people oriented, warm and helpful. These generalisations create authoritative norms about gender roles that shape how women and men imagine their own ideal selves. This implies that women have a role to play in ensuring their own emancipation from this gendered notion of leadership through enhancing their self-efficacy and avoiding the 'sticky floor' that holds them in follower roles (Braun et al. 2017, p. 384).

The organisational challenges facing women can be cushioned through a positive peer climate (Ribeiro et al. 2016). This positive effect can be enhanced if the 'queen bee syndrome'—the tendency of some female leaders to distance themselves from other women and to refrain from guiding them—is minimised (Derks et al. 2016). Other forms of peer support can be sought from the new generation of employees. More young men want a balanced life, are now changing their own priorities, and are more likely to be supportive of initiatives that benefit both women and men, rendering them both allies and advocates of women's empowerment (Burke 2017). The development of networks can also motivate vulnerable women employees and provide a platform for shared issues.

- The role of the management education provider

Women are typically under-represented on business management programmes. A study showed that this under-representation was related to the improbability (perceived or actual) of managing the triple burden of job, study and childcare when childcare responsibilities in South Africa continue to fall principally on women (Ronnie and Wakeling 2015). Widespread adoption of practices targeting female TM is poor within African business schools (Ibeh and Debrah 2011) and education providers should seek to shape practice that enables the achievement of SDG 5. Management education providers should pay more attention to the delivery of career mobility opportunities for women through more targeted educational interventions, including the setting of career objectives, leadership development, the ability to design systems that reduce stereotypical bias—in short, provide women with the tools to positively shape their work environment.

13.5.2 Supportive Policies and Enabling Culture

- Advice for organisations

Organisations should have appropriate policies and move beyond the notion that gender parity, once achieved, is enough. TM programmes should feature as a sustained organisational initiative that is not abandoned once specific targets

are achieved. Importantly, organisations need to assess whether their policies help or hinder female participation and progression in the workplace (Yee 2014). Gender-friendly policies may include flexible working hours (Ibeh et al. 2008) and work/life balance programmes should be promoted (Burke 2017). The provision of childcare facilities at work would prove helpful for parents who would want to return to work. An authentic commitment from the organisation to encourage appropriate behaviours and cultural attitudes that can be adopted to foster a more inclusive and potentially holistic workplace environment will initiate the start of culture change. Traditional ways of working (e.g. strong, hard, single leadership) will need to evolve to be more intuitive, flexible, adaptive and collaborative. This evolution will necessarily give women the opportunity to play a more substantive role in shaping the workplace.

Employment equity and diversity need to be taken seriously and should demonstrate management commitment rather than compliance behaviours. Creating a sense of belonging, particularly for black women (Nzukuma and Bussin 2011), ensures that all employees within the work environment feel their sense of worth. The disturbing finding that black South African men expressed the strongest belief in the 'think-manager–think-male' paradigm has been highlighted (Booysen and Nkomo 2010). Within the transformation-focussed agenda, where black men assume an increasing number of senior executive roles, these views may not encourage the representation of women in management or address real issues of gender disparity and inequality in South Africa.

- Advice for women

Women need to create peer networks and discuss their career ambitions. They need to ensure they have a voice within the organisation that they shape TM approaches that retain female talent and help them balance a range of competing pressures. Women should attempt to highlight and discuss unfair policies. This is most likely to occur when they are part of supportive and enabling networks. In terms of shaping their own career trajectories, women should seek out and participate in training and development activities, find mentors and apply for a wide range of work opportunities in positions that have bottom-line impact. They should insist on gender-friendly practices and processes, and request involvement in challenging projects that enhance their careers (Burke 2017).

- The role of the management education provider

Beyond the issue of women's representation on management development programmes, it is important that education providers mirror desired organisational realties in their interface with students. The shortage of local talent in South Africa is a key concern amongst employees and students need to be aware of how to design and implement TM systems. Much will depend on the criteria used to assess talent and perceptions of the TM concept. TM appears gendered within the South African context and educational materials will need to consider the use of gender-sensitive material, including the careful selection of case studies with female protagonists; the use of female pronouns when citing management behaviours, the inclusion of female presenters and teachers—some of whom may act as role models for both men and women. This is of particular importance in a patriarchal society like South Africa. As noted in the focus groups, undermining behaviours and attitudes are still rife across industries and the education setting is not immune from this trend (CEE 2017).

13.6 Conclusion

Female TM in South Africa is limited, and women's careers remain hampered by ongoing gender inequality and poor organisational practices. There is a need for inclusive environments in which employees, most particularly women, feel safe to get involved, generate ideas, plan and execute them. This is what we think women want in their workplace: to have space to experiment

and show the value that their unique perspectives can add to organisational success. If organisations trust women and develop relevant TM approaches that give them the freedom to pursue different avenues, they will be more likely to retain their female talent. Currently, the South African workspace fails to realise women's potential because their systems are designed to listen to only one frequency. Women must either leave or temper their message to fit that frequency. This diminishes their value and undermines the objectives of SDG 5.5. To reverse this trend, South African organisations need to identify and maximise their female talent. Women themselves have a role to play in this regard.

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14 Securing Inclusive Growth: Mentorship and Youth Employment in Kenya

Joy M. Kiiru and Laura Nelima Barasa

Abstract

The guiding framework for policymaking in Kenya embodies both a national and international outlook. On the one hand is the Kenya Vision 2030 while on the other are the Sustainable Development Goals (SDGs). Coincidentally, both frameworks emphasise social inclusion, or what is commonly known as inclusive growth. While day-to-day policies must be located within Vision 2030, the Government of Kenya (GoK) has also launched a roadmap for the implementation of the SDGs and acknowledges that inclusive access to employment is a critical solution for eradicating poverty. Youth unemployment in Kenya is the highest in the region, posing a significant policy issue. The GoK has implemented several programmes to deal with youth unemployment but with dismal results. Addressing youth unemployment is a big step towards achieving SDG 8 and has significant implications for SDG 1. The main argument in this chapter is that government interventions for youth employment are mainly supply driven and take no cognisance of the contextual realities of the youth. In this chapter, we propose an integrated supply and demand framework for addressing employment interventions. Such a framework would integrate academic programmes with skills that empower the youth beyond the realm of academic qualifications.

Keywords

Employment interventions · Inclusive growth · Mentorship · Youth employment

14.1 Introduction

The global youth unemployment rate stood at 13% in 2016 and was expected to persist at the same level through 2017, up from 12.9% in 2015 (International Labour Organization (ILO) 2015). The reported unemployment rate usually understates the enormity of youth unemployment because it excludes those that do not participate in labour markets at all. There is, however, a greater concern about the number of youth who are working yet still live below the poverty line. This is the category of youth who are either employed or self-employed, mostly in the informal sector. About 37.7% of working youth suffer moderate to extreme poverty relative to 26% of working adults. In addition, 71% of all working poor youths are in developing countries (ILO 2015). Achieving the Sustainable Development Goals (SDGs), especially Goal 8 which calls on

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nations to 'promote sustained inclusive and sustainable economic growth, full and productive employment and decent work for all' presents a major challenge in the context of the dual problem of youth unemployment and poverty among the employed. Any decent work should ideally provide an opportunity for households to live free from poverty.

The spirit embraced in SDG 8 is that addressing unemployment should go beyond providing mere employment opportunities and should also include the provision of decent employment opportunities as a means of extreme poverty eradication. Inclusive growth, on the other hand, is about the distribution of the benefits of economic growth to all and, more specifically, inclusive distribution of productive employment as a means of increasing the incomes of poor and other excluded groups and improving their standard of living (World Economic Forum (WEF) 2017). Without inclusive growth, it would be difficult to experience sustainable growth in the long run. In cases of jobless growth, inclusive growth encompasses deliberate resource allocation by policymakers to all sectors of the economy in order to ensure that the whole population benefits from growth, even when lacking the opportunity for productive employment (WEF 2017). In this chapter, we argue that as long as unemployment pertains largely to youth, economic growth is not inclusive and is unsustainable. Ultimately, it would be difficult to achieve SDG 8. We acknowledge that the challenge of youth unemployment is already a policy issue in Kenya and the government has made an effort to address the problems faced by the youth. The first was the creation of a ministry dedicated to youth and sports in 2005, followed by the formulation of the first National Youth Policy (NYP) in 2006. A strategic plan for the period 2007–2012 was later developed, opening the door for several other youth unemployment interventions as discussed below.

Despite the efforts by government, youth unemployment in Kenya rose from 14.6% in 1998/1999 and 12.7% in 2005/2006 to 17.1% in 2013 and 22.2% in 2016, being the highest in the region (World Bank 2009). We argue that some of the factors undermining youth employment interventions include a mismatch between the demand and supply of youth employment opportunities. More specifically, we argue that the youth lack essential life skills and suffer from low self-esteem and motivation that prevent them from actively and effectively demanding and pursuing employment opportunities. We propose career mentorship coupled with life skills training and career information/networking for creating effective demand for employment and increasing the youth employment absorption capacities. We contend that the existing government interventions for youth employment are only supply driven, in the sense that policymakers decide what policies to put in place and 'impose' them, regardless of the absorption capacities or any signalling whatsoever by the youths.

More than a million young people enter the labour market in Kenya every year having either dropped out of school or completed school and not enrolled in any other institution of learning. More than 150,000 youth also join the labour market every year having completed higher education or vocational training. Furthermore, the skills acquired by college and university graduates in Kenya often do not meet the expectations of employers. Besides limited employment opportunities, the youth in Kenya face various other challenges including a perceived mismatch between education/training and the requirements of the labour market, information asymmetry on available job opportunities, gender and other cultural biases, poor geographical distribution of jobs, as well as lack of mentorship and career guidance. We argue that career guidance and mentorship contribute to high self-esteem and self-drive which are key determinants of effective individual demand for employment opportunities.

14.2 Who Are the Youth?

There is no universal definition of youth; rather, various definitions exist depending on the context and the purpose for which they are used. The United Nations (UN) defines the youth within the

notion of physical maturity and skills development in preparation for participation in economic and political spheres of life; the youth as so defined are those individuals between 15 and 24 years (United Nations Department of Economic and Social Affairs (UNDESA) 2014). The World Bank, on the other hand, defines the youth within the context of knowledge and skills creation. As such, the World Bank defines the youth as persons between the ages of 12 and 24 years (World Bank 2009). In the Kenyan policymaking spheres, the youth are those persons between the ages 15 and 35 years, mirroring the intention to enhance youth employment policy outcomes. Various Kenyan pieces of legislation outline the rights and responsibilities of a person according to their age. The National Youth Council Act of 2009 and the Constitution of Kenya 2010 defines the youth as persons between the ages 18 and 34. Cap 33, also known as the age of majority, states that 'a person shall be of full age and cease to be under any disability by reason of age after attaining the age of 18 years'. In addition, the Employment Act of 2007 holds that 'no person shall employ a child below 13 years whether gainfully or otherwise, while those between the ages of 13 and 16 may only be employed in non-labour intensive functions'. The youth in Kenya comprise 35% of the Kenyan population, and are the worst hit with an unemployment rate at 67% (Kaane 2014). Nevertheless, the GoK captures both open youth unemployment and underemployment in their definition for youth unemployment. Unemployment in Kenya has therefore been predominantly described as a youth problem. Figure 14.1 shows that although the Gross Domestic Product (GDP) annual growth rate has been on a slow but increasing trend over time, youth unemployment has generally surpassed the GDP growth rate over several decades. Slow economic growth, indicative of low aggregate demand, results in low demand for labour leading to high unemployment rates (O'Higgins 1997). In addition, rapid population growth, lack of employment opportunities for youth compounded with lack of appropriate employment skills intensify youth unemployment in Kenya (Muiya 2014). It is therefore clear that despite the efforts being made to reduce youth unemployment, the problem keeps growing over time.

Table 14.1 shows that the informal sector dominates the employment sector in Kenya. This is mainly because the formal sector does not yield enough jobs and also because Kenya does not have unemployment safety nets making it impossible to quit the labour market. According to the World Bank, 'most of these workers [in the informal sector] operate under a high degree of informality and vulnerability, resulting in small and unpredictable incomes, poor working conditions and low productivity. Such informality is

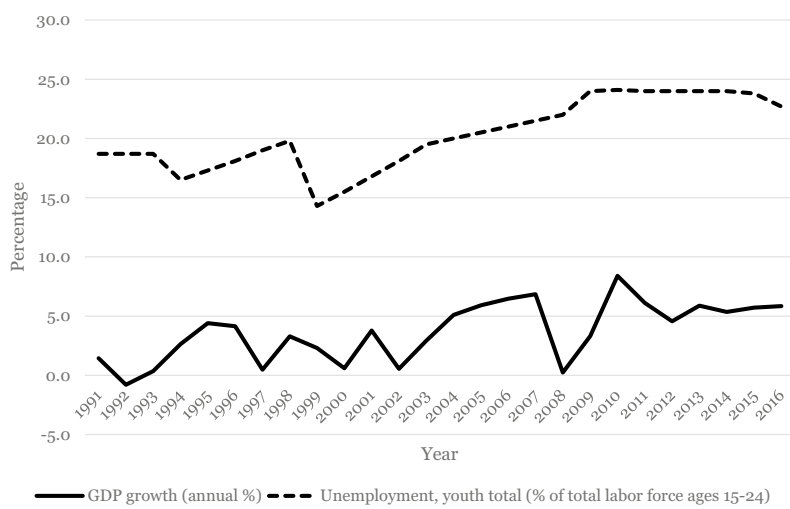


Fig. 14.1 Youth unemployment and GDP (Calculated from World Bank publications 2018)

Table 14.1 Shares of Kenya's total employment, 1985–2014 (Author compilation from Kenya National Bureau of Statistics)

Year	Modern sector: wage employment (%)	Modern sector self-employed and unpaid family work (%)	Estimated informal employment (%)
1985	80.33	2.26	17.14
1988	77.47	2.54	20.00
1991	56.38	2.04	41.58
1994	44.86	1.74	53.41
1997	35.06	1.36	63.57
2000	28.68	1.10	70.22
2003	23.53	0.90	75.57
2006	20.66	0.75	78.60
2009	19.13	0.65	80.23
2012	16.87	0.60	82.53
2013	16.89	0.62	82.49
2014	16.56	0.72	82.73

likely to trap people into poverty' (United Nations Economic Commission (UNECA) for Africa 2015), giving rise to poor working populations in many Sub-Saharan Africa countries.

Despite Kenya's economic growth, overall unemployment persists, a phenomenon attributed to the high growth of the working-age population. However, relative to growth of the informal sector, waged employment does not seem to be correlated with economic growth. Hence, much of Kenya's economic growth has mainly been jobless, owing to technological innovations that drive productivity.

14.3 The Link Between Youth Employment Initiatives and the Sustainable Development Goals

The Kenya NYP was first developed in 2006 in the wake of numerous challenges facing the youth. While the number of agencies handling youth challenges had increased over time, the absence of a comprehensive policy outlining the role of the youth in national development has rendered most organisations' initiatives ineffective at handling these challenges. The NYP highlights unemployment and underemployment as the most dominant challenges faced by youth in Kenya. The main objective of this policy is to create opportunities that improve the quality of life for all categories of youth, and empower youth as partners in development. The NYP emphasises that youth are a vital resource for national development and lays out a broad framework for youth development involving key stakeholders comprising the private sector and civil society. The NYP sets the stage for the inclusion of the youth agenda in the national long-term development plan known as Kenya Vision 2030 that was launched in 2008 (Fig. 14.2).

The main objectives of the Kenya Vision 2030 include making Kenya a globally competitive and prosperous nation that provides a high quality of life to its citizens. This national long-term blueprint aims to transform Kenya into an industrialised middle-income country by 2030. Along with this, the Vision 2030 prioritises development plans that were instrumental in implementing the Millennium Development Goals (MDGs) that have since been replaced by the SDGs. Essentially, Vision 2030 provides a vehicle by which SDGs can be implemented within the national context. Vision 2030 is anchored on the three pillars of economic, social and political governance. Additionally, Vision

Fig. 14.2 Employment and growth in Kenya (Author compiled statistics and data from Kenya National Bureau of Statistics)

2030 affirms that the environment and natural resources are underlying sectors that enhance sustainable economic growth. The economic pillar focuses on sustained economic growth and targets a 10% annual gross domestic product growth rate. The social pillar focuses on improving social inclusion for vulnerable groups including youth and providing a clean and secure environment. The political governance pillar aims at building an issue-based and accountable democratic political system.

Vision 2030 is being implemented through a series of 5-year Medium-Term Plans (MTP). The first MTP (MTPI) was implemented between the years 2008–2012. The second MTP (MTPII) covered the years 2013–2017. Both MTPs acknowledge that youth unemployment is a serious challenge and focus on creating employment opportunities through several flagship programmes that, falling under the Ministry of Public Service, Gender and Youth Affairs, specifically target youth. These flagship programmes—including but not limited to the Youth Enterprise Development Fund (YEDF), UWEZO Fund, National Youth Service (NYS), and the Kenya Youth Employment Project (KYEP)—are key programmes aimed at addressing youth unemployment. These programmes are primarily linked to the realisation of SDG 1 and SDG 8. We turn our attention to the objectives and achievements of some of the youth employment programmes.

The YEDF, which was established as a state corporation in 2007, focuses on increasing economic opportunities and employment by fostering youth entrepreneurship. The fund also facilitates youth in obtaining jobs overseas in a twin project known as Youth Employment Scheme Abroad. YEDF has disbursed KShs. 12 billion to more than 880,000 youth since its inception (GoK Online 2018). Subsequently, KYEP was launched in 2010 and implemented between 2011 and 2016 by means of a public–private partnership between the government and the Kenya Private Sector Alliance (KEPSA). KYEP was involved in capacity-building programmes providing internships and training. The youth placed in the formal sector received training in life skills, core business skills and sector-specific training that focused on equipping unemployed and underemployed youth with skills and experience that are requisite for full participation in the labour market. The youth placed in the informal sector were trained in entrepreneurship skills. Over 20,000 youth received training while about 13,000 youth received internship placements. About 75% of the youth in internships successfully secured waged employment or self-employment. In addition, an impact evaluation of 14 months after

the programme showed that 80% of the male youth reported being in paid employment compared to 69% from the control group, which translated as a 10.8% gain. Furthermore, the gain increased to 14.2% for those who completed the training programme. The female youth reported a 6.7% gain for those placed in internships and an 8.7% gain for those who completed the training programme. Owing to the success of KYEP, there is a proposal to develop a national level programme, KYEOP which seeks to increase youth employment and earning opportunities (GoK Online 2018).

The UWEZO Fund was launched in 2013 and established in 2014 under the Public Finance Management Act (No. 21 of 2014). The main objective of the UWEZO Fund is to enable disadvantaged groups, including youth, to access funds for business enterprises, to promote self-employment and to enhance economic growth. The Fund also has a capacity-building programme that provides mentorship support. The Fund has disbursed KShs. 5.1 billion since inception with 19,461 youth groups benefitting from the financing and training (GoK Online 2018). Lastly, NYS is a government department that was established by an Act of Parliament (Cap 208 Laws of Kenya) in 1964. The NYS was relaunched in 2014 with particular focus on unemployed youth. The NYS provides 4 months of training in various technical skills including but not limited to paramilitary training, plumbing, masonry and dressmaking with graduation taking place every 6 months for recruits that successfully complete their training. Slightly over 62,000 recruits have graduated from the programme (GoK Online 2018).

The discussion above highlights that the government is committed to dealing with youth unemployment. However, the persistent nature of youth unemployment suggests that more needs to be done. To the best of our knowledge, no empirical studies examining the impact of the highlighted interventions have been conducted with a view of formulating evidence-based policies. Rather, we contend that most of the youth unemployment interventions in Kenya are sustained by the political motive due to the predominantly youthful population. However, the results of these initiatives suggest that more needs to be done in order to address youth unemployment. Our main thesis is that government interventions are mainly supply driven and lack a mentorship component for stimulating the demand side. These interventions should be evaluated within a broader theory of change.

14.4 Theoretical Framing: Theory of Change

To achieve inclusion as in the spirit of the SDGs would require bold and targeted policies within the context of a dynamic and complex socio-economic setting. Policymakers will need a roadmap for policy planning, implementation, monitoring and evaluation. The theory of change provides a tool for planning, participation, and evaluation of policy implementation and outcomes. The theory of change first maps the long-term policy goals and then evaluates backwards to identify the necessary preconditions for attaining these goals. 'Theory of change is essentially a comprehensive description and illustration of how and why a desired change is expected to happen in a particular context' (Center for Theory of Change Online 2018). To apply the theory of change in the context of SDG 8, we first map out who is most affected by unemployment, their socio-economic disposition and the changes that need to occur at both the policy level (supply forces) and at the individual unemployed person's level (demand forces). Policies that fail to address unemployment from both the supply and demand side will be disjointed and are unlikely to culminate in the desired goal of unemployment reduction.

From a different perspective, theory of change could be defined as a chronology explaining how a programme impacts its beneficiaries. It outlines all the things that a programme does for its beneficiaries, the ultimate impact that it aims to have on them and all the separate outcomes that lead or contribute to that impact (Gertler et al. 2016). From this perspective, a theory of change based on career mentorship, life skills and

networking to reduce youth unemployment would be a powerful tool for programme development, communication of impact and programme evaluation. Theory of change requires five core processes as shown in Fig. 14.3. These processes are vital and form the theoretical foundations for empirical testing of the theory.

We develop our theory of change based on the argument that, despite the numerous youth unemployment interventions undertaken by the GoK, youth unemployment remains a significant challenge because the interventions are supply driven, suggesting that policymakers draft interventions unilaterally and without any consultation on the absorption capacity by the youth. We further assume that the consequences of youth unemployment have had a demotivating effect on the youth. Additionally, we assume that the youth also suffer information asymmetries on available jobs and employment capacity-building opportunities. Finally, we conclude that the apparent mismatch between supply of and demand for youth employment interventions is a policy issue that needs to be addressed in order to maximise policy outcomes. Figure 14.4 displays the framework for the theory of change explaining how interventions stimulating the demand side of youth employment impact the youth and eventually increase participation in employment programmes in both the public and private sectors.

Empirical research is critical for testing and building upon the theory as proposed in this chapter. The whole objective of the theory of change is to formulate a conceptual framework for embedding 'the correct mind set' in educational programmes. Equipping students with good academic qualifications is critical but not sufficient to guarantee successful livelihoods arising from productive employment. There are other important prerequisites to employment, including emotional intelligence and behavioural patterns (Jayaram and Sinaceur 2016), which we refer to as life skills in this chapter. Emotional intelligence in combination with mentorship and coaching is crucial for continued growth. These four concepts: mentorship, networking, career information and life skills are activities that the theory of change embeds in the design and implementation of educational programmes. This framework aims to equip youth with not only skills and information but also the desire (demand) for successful careers and employment that ultimately benefits the economy and propels

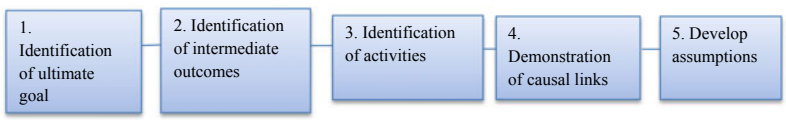
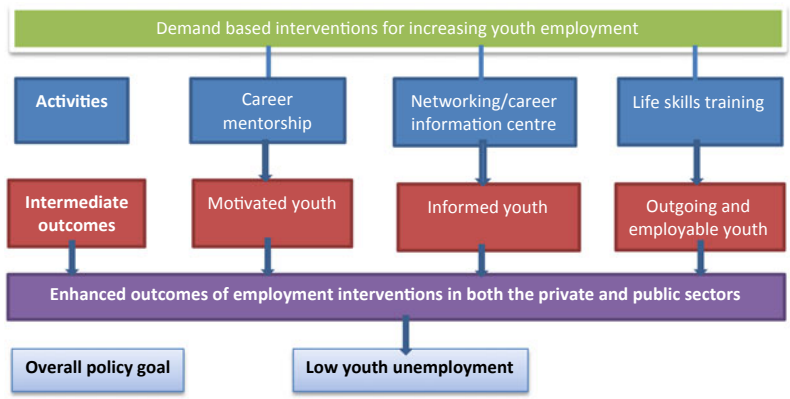


Fig. 14.3 Theory of change core processes (Center for Theory of Change Online 2018)

Fig. 14.4 Theory of change for demand-driven youth employment interventions (Authors' conceptualisation)



the country towards inclusive employment. Some countries have modelled their educational and training programmes around these principles.

14.5 Lessons from Other Countries

Demand-side interventions, including mentorship and life skills development, are useful catalysts for career growth and innovation (Myers 2016). It is now a policy requirement in many developing countries that learning institutions such as high schools form partnerships with industry-based organisations, other learning institutions, community groups and business associations. These partnerships are instrumental in bridging classroom knowledge and exposing learners to skills that match industry demand. Exposure to industry experience at an early age acquaints learners with skills matching the labour market demand, and also motivates youth to actively take charge of their career growth. In a study conducted in Australia, Klatt et al. (2016) argue that 'teaching and educational provision no longer remain exclusively linked to one institution, and new and innovative programmes are being implemented to involve the wider community in learning and skills development'. Industry exposure helps learners internalise the reality of transitioning from dependence to independence. In a country like Australia, for example, secondary schools offer applied subjects and it is a requirement that learners are linked with industry-based organisations for hands-on experience to complement classroom knowledge. Klatt et al. (2016) highlight the importance of applied learning in increasing access to the curriculum and enriching learners' experiences in secondary schools across Organisation for Economic Co-operation and Development (OECD) nations in the 1990s. Exposure to work experience while in secondary school is likely to enhance creativity and innovativeness, and handy skills for those who may not find employment after school.

South Korea also suffers the challenge of youth unemployment arising from jobless growth. Young people in South Korea are highly educated. In 2012, tertiary education enrolment stood at 98.4% up from 74.2% in 1999 (United Nations Economic and Social Commissions for Asia and the Pacific (UNESCAP Online 2018). Despite the high educational attainment, young people in South Korea are three times more likely to be unemployed and young men have consistently faced a higher unemployment rate than women (ILO 2015). The government of South Korea has therefore prioritised youth employability and the matching of skills acquisitions to the needs of enterprises. To this end, South Korea has developed a youth employment policy that addresses both supply and demand issues of youth employment. On the supply side, just like in the Kenyan case, the South Korean government has initiated funding programmes for youth enterprises in a bid to cultivate an entrepreneurial spirit. However, the Korean government complements enterprise development with education, training in vocational education as well as career guidance and counselling programmes that impart life skills. Vocational training in Kenya has largely been undermined by the high emphasis on tertiary education programmes. Indeed, the recent expansion of tertiary education led to the conversion of most vocational training facilities into institutions of higher learning.

Unlike South Korea, the concept of career guidance and mentoring is yet to be embraced as public policy in the training and education system in Kenya. Learners in South Korea receive career guidance in industry-related jobs and young women are mentored to pursue a path in science and technology. These interventions are well structured and anchored in government policy on youth employability and therefore benefit from government funding. The government of South Korea also supports work experience for learners through internships and work–study exchange programmes. The policy on educational qualification in South Korea 'allows for a better connection between education and training, qualifications and industries. It also provides a plan for improving the National Skills Standards and establishing a qualification system' (ILO 2015). Furthermore, South Korea has enacted a special Act on human resources for small and medium enterprises in order to address demand for

labour in the context of jobless growth. The Act enables government to subsidise wages for unemployed youth. Firms offering internships and on-the-job training opportunities for learners receive wage subsidies from government. There is also legislation on labour standards that regulates the employment of juveniles by specifying the nature of businesses and conditions under which juveniles can be legally employed. This legislation protects young children (13–15 years) who hold a certificate of employment from possible exploitation. A crucial supply-side policy under the Korean youth employment model is found under the special Act on youth employment promotion. Under this Act, 'the public employment service of Korea targets young people with inadequate education or work experience by providing them with career path designs, career motivation and work experience' (ILO 2015).

The United Kingdom acknowledges that 'good career guidance is critical if young people are to raise their aspirations and capitalise on the opportunities available to them' (The Careers & Enterprise Company 2017). Career guidance is pivotal for delivering sound technical education reforms and can be described as a vehicle for social justice, especially for marginalised youth who are likely to suffer information asymmetries, learn in underequipped schools and generally lack exposure. In 2013, Gatsby commissioned a study to determine what comprises good career guidance by international standards (Gatsby Online 2018). The study identified a set of eight benchmarks that can be used as framework for improving career provision for the youth. These include a stable careers programme, learning from career and labour market information, addressing the needs of each pupil (mentorship), linking curriculum learning to careers, encounters with employers and employees, experiences of workplaces, encounters with further and higher education, and personal guidance and counselling.

The examples of Australia, South Korea and the United Kingdom illustrate that the idea of an integrated learning programme is not far fetched, rather it is an idea that is gaining traction. Essentially, there is much to be gained when academic programmes are reinforced with mentorship, networking and life skills that enhance employability, resulting in active demand for employment. However, the implementation process must consist of a strong monitoring and evaluation framework to build an evidence base. A limitation is that these interventions are yet to be subjected to impact evaluations. We therefore underscore the need for empirical research to ascertain their importance for employment creation and sustainable inclusive development.

14.6 Conclusion

The challenge of youth unemployment in Kenya cannot be overstated. The authors acknowledge the government's effort in resolving youth unemployment. To this end, we discussed several youth employment initiatives undertaken by the GoK. In our review of these interventions, we highlight the lack of consultation with the key stakeholders—the youth. Consultation with the youth in the design and implementation of youth unemployment interventions is critical for positive and sustained outcomes. We delineate such interventions that disregard youths' realities as only supply driven and devoid of the demand component that is imperative in making them more efficient in reducing youth unemployment. The experiences of Australia, South Korea and the United Kingdom suggest developing the demand side of youth employment interventions would be critical in resolving some of the current challenges, including the mismatch between classroom learning and job market requirements. As we have argued in this chapter, the supply of employment interventions needs to be complemented by an efficient demand that can only be developed by incorporating mentorship, career guidance, networking and life skills as part of training at all levels of learning. We alluded to the role of the private sector in collaborating with the public sector in the

development of the demand-side model of youth employment interventions. Further research could dwell on the pragmatic model and empirical evidence arising from impact evaluation analysis.

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15 The Challenge of Obtaining a Decent Work Environment in Sub-Saharan Africa

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Abstract

Workers represent half of the world's population and are the major contributors to socio-economic development. Continued, sustainable socio-economic development is only possible if workers have a decent working environment. The headline for Sustainable Development Goal 8 is to 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all', while sub-goal 8.8 is to 'Protect labour rights and promote safe and secure working environments for all workers'. However, globally millions of working men and women have poor and hazardous working conditions. Despite knowledge about effective interventions to prevent occupational hazards and to protect and promote health at the workplace, large gaps exist between and within countries regarding the health status of workers and their exposure to occupational risks. This chapter will describe present work environment situations in Sub-Saharan Africa through focusing on four important industries: floriculture, construction, mining and textiles. Actions are suggested for improvements while the importance of developing competence and knowledge on occupational health in these Sub-Saharan African countries are underlined. There must be increased awareness of dangerous workplaces as well as efforts to prevent occupational accidents and diseases.

Keywords

Employment · Occupational health and safety · Work environment · Sub-Saharan Africa

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15.1 Introduction

Today, several countries in Sub-Saharan Africa (SSA) are experiencing economic growth, increasing industrialization and urbanisation. However, growing industrialization is often

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associated with hazardous working conditions (Disease Control Priorities Project 2007). Despite the knowledge we have about effective interventions to reduce occupational hazards and to protect and promote health at the workplaces, large gaps exist between and within countries regarding the health status of workers and their exposure to occupational risks (World Health Organization 2007). We are therefore far from achieving Sustainable Development Goal (SDG) 8: 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'.

Occupational Health is a scientific area of importance and relevance for all workers. However, the knowledge and practice is marginal in many developing countries, particularly in Africa. There is little education in Occupational Health at schools and universities in many countries, while competencies in health personnel, politicians and other stakeholder are often low. As a result, there is limited legislation and few guidelines. This means that workers are often not protected from harms arising from different health risk factors at work. The situation is concerning as the number of occupational injuries and diseases are increasing in these countries (Hämäläinen et al. 2011; Takala et al. 2014; Kumie et al. 2016). More access to knowledge about Occupational Health would help to reduce work-related injuries and diseases.

In this chapter, we focus on factors relevant to SDG sub-goal 8.8, which aims to reduce the aforementioned problems: it aims to 'Protect labour rights and promote safe and secure working environments for all workers'. We examine four important industries in SSA, chosen because the number of workers employed in these sectors has been greatly increasing: floriculture, construction, mining and textiles. The chapter identifies key challenges pertaining to work and health in SSA and highlights the importance of developing a decent work environment in these four particular industries.

15.2 The Flower Industry

15.2.1 Description of the Flower Industry

Floriculture is a rapidly growing economic activity involving thousands of workers. There is a huge demand for quality floral products in both local and export markets. Africa is an important continent for this industry. This is due to a number of factors including favourable investment policies, land availability, a wide range of climatic conditions supporting production of a variety of crops, access to markets through preferential and other regional/multilateral schemes, peace and stability in several countries, and cheap labour and laxity in law enforcement. In Tanzania, for example, the enforcement authority that is responsible for worker welfare does not even have a complete list of all the establishments involved, only the large- and medium-sized commercial industrial firms that are willing to pay for inspections. The African countries leading in horticultural production include Kenya, Ethiopia, Zimbabwe, Uganda, South Africa and Tanzania. The top ten flower importers are the Netherlands, Germany, Saudi Arabia, Norway, Belgium, the United Arab Emirates, Japan, USA, France and Italy.

Various types of flowers are grown for export. Those grown in greenhouses involve significant challenges for the health and safety of the workers. In addition, most workers are female, and female workers are most affected by poverty as they are frequently trapped in the lowest paid, least skilled and most precarious occupations, such as those found in floriculture (Njagi 2018). In the greenhouses, the flowers are planted, nurtured (watered, sprayed with chemical fertilisers and pesticides, weeded) and harvested (cut and transported). Sprayers (mostly males) apply pesticides to the flowers in the greenhouses, and irrigation workers handle the supply of water and fertilisers through the plastic tubes. Females are generally involved in planting,

weeding/pruning, cutting and sorting flowers. Sorted flowers are brought to the packing house where they are packed and made ready for export (Nigatu 2017). Different types of pesticides are used to ensure that insects and disease microbes will not damage the flowers.

15.2.2 Risk Factors for Health at Work, Focus upon Intoxications

Pesticides are chemicals or a mixture of chemicals produced to control pests. They are composed of a variety of substances, which increases their potency for killing the target organisms. However, despite the role they play in pest control, it is increasingly recognised that pesticides may pose significant short- and long-term health risks to humans. These chemicals are inhaled or absorbed through skin during work involving these substances. The World Health Organization (WHO) has estimated that 25 million agricultural workers in developing countries sustain an incidence of acute pesticide poisoning annually (Mrema et al. 2015). Such intoxications are serious and life threatening. Research has drawn attention to the particular vulnerabilities of women, children and migrant populations to the hazards arising from pesticide exposure (Ngowi et al. 2016).

Pest control operators, farm workers and their families in Africa are at higher exposure to risk than the general population. In addition, these employees may have very rudimentary understanding of the dangers associated with pesticides. They often are trusting of the employers, regulatory authorities and scientists/experts in matters related to pesticides and their health and safety (Negatu et al. 2017). The lack of knowledge and awareness of the workers about the risks of pesticide exposure may lead them to unsafe use of these pesticides, although instructions on precautionary measures during handling are normally on labels.

The extent of harm due to pesticides is hard to quantify in Africa due to lack of reliable data. Poisoning surveillance is a necessary tool to document incidents such as that of a methomyl poisoning involving 11 female floriculture workers in Arusha, Tanzania in March 2004 (Ngowi et al. 2016). These women collapsed in a greenhouse and were rushed to hospital. Some of them were unconscious and others complained of headache, nausea, chest tightness and stomach ache. The symptoms presented were weakness, vomiting, restlessness and breathing difficulty. The incident investigation was not conclusive and although it was reported in the press, the absence of adequate, competent local investigation mechanisms prevented its documentation in the peer-reviewed literature. In addition to crisis events, investigations into longer term chronic effects are challenging. A study conducted in Ethiopia revealed strong associations between occupational pesticide exposure and respiratory symptoms and reduced lung function in commercial farming systems (Negatu et al. 2017). In addition to exposure to pesticides, workers in this industry lack job security and occupational health services.

15.2.3 How Can We Achieve Decent Work in the Flower Industry?

To prevent risk factors that cause adverse health problems, occupational safety and health management systems within enterprises must be able to prevent or control all types of hazards at work, from accidents and diseases to specific issues such as the use of pesticides. There must be a framework for the enforcement of national laws and regulations that cover employment in agriculture and other informal sectors. Finally, there is a need for more knowledge and promotional material to support, coordinate and monitor progress and thereby bring about lasting improvements in Occupational Safety and Health (OSH). Without this framework, safe and decent workplaces—as aimed for in SDG 8—will not develop. There is a particular need for focus on the harmonisation of reporting systems, such as injury and disease reporting, in OSH, as well as in the movement and use of hazardous chemicals and pesticides across

the region. The International Labour Organization (ILO) has provided guidance and various measurement tools to African member countries. However, each of these countries is at a different stage of OSH implementation, and there is a need for collaboration. An example of an OSH action that could be implemented immediately is to provide the workers with the needed personal protective equipment and train them to use it.

15.3 The Construction Industry

15.3.1 Description of the Industry

The construction industry is often classified into the building construction sector, the infrastructure sector and the industrial sector. The first concerns residential and non-residential (commercial/institutional) structures. The second deals with engineering works such as dams, bridges, highways and railways construction as well as water or waste water and utility distribution systems. The third includes various industrial processes such as refineries, chemical processing, power generation, mills and manufacturing of construction materials. Construction is a key sector for economic development worldwide. Growth of the construction industry in SSA, such as in Ethiopia and Tanzania, is coupled with the rapid economic growth in the region. Most industries in SSA are characterised by high investment and labour-intensive work. A considerable number of people are employed in the manufacture of construction materials.

15.3.2 Risk Factors for Health at Work; Focus upon Noise Exposure

Workers in the construction industry experience various work-related health hazards. However, there is insufficient attention given to the health and safety of construction workers in SSA (Mrema et al. 2015; Kumie et al. 2016). More than half of occupation-related deaths and injuries worldwide were from this type of industry, so construction workers are particularly susceptible to work-related injuries or to develop distinct types of work-related diseases. Of the worldwide total of occupationally related deaths and injuries, most were from developing countries (Lopez-Valcarcel 2001). Metal is a growing industry in SSA. It produces the steel bars that are widely used for the construction of bridges, rails, towers and buildings, as well as raw materials in other industries such as in vehicles and machinery. The increased demand for steel bars in construction attracts more investments in this type of industry in SSA. Noise is among the ubiquitous physical hazards in the metal industry. Steel bar production generates noise during several of the process involved, including handling and/or sorting of raw materials, weighing and transfer of steel billets from one location to another. Noise from machinery and the impacts between moving metals also contribute significantly to noise levels at work. Noise exposure levels above 85 dB(A) have been documented in metal industries (Ologe et al. 2006; Nyarubeli et al. 2018).

Prolonged high noise exposure at this level is well documented as causing hearing loss or deafness. In 2005, it was estimated that noise exposure caused 16% of adult disabling hearing loss with the global prevalence varying from 7 to 21% (Nelson et al. 2005). A recent study in Tanzania found a high prevalence (49%) of hearing loss among male workers in the iron and steel factories (Nyarubeli et al. 2018). Similar findings have been reported from Nigeria (Ologe et al. 2006). This means that half of the workforce in this industry has serious communication problems. This is not a situation we should accept when we try to fulfil SDG 8.

15.3.3 How Can We Achieve Decent Working Conditions in the Construction Industry?

There is a lack of effective noise control measures in the construction industries in SSA. The most important issues in controlling noise levels lie,

however, in the policy framework and institutional capacity in each country or inter-country networks that may help to make the agenda viable. Countries such as Tanzania and Ethiopia have not yet established country-specific occupational noise exposure limits to guide their respective regulatory authorities and investors in noise control. The lack of rules and regulations creates a gap between law enforcement on one hand and strategic planning on the other.

Controlling noise at an industrial workplace is a comprehensive lifetime undertaking in which everyone at a workplace needs to feel responsible for its success. What is needed is a specific occupational health and safety policy, addressing safe and decent workplace with good pay for equal work value as stipulated in SDG 8. Other needs include legislation, an active workers' union as well as industrial and other stakeholders' involvement. There are several methods for reducing noise, including different engineering methods, administrative/legislative controls and hearing protective devices (Tikka et al. 2017). The most commonly used noise control measure in industry is the use of hearing protective devices (earplugs and muffs). However, this intervention alone requires technical competency to choose the correct devices. Worker training in the reasons for using protective devices and how to use them correctly is very important. Hearing conservation programmes should be developed to control noise at workplaces. This requires the commitment of all the stakeholders, including adequate training, planning, implementation, monitoring and evaluation at each stage.

Working conditions in the construction industry therefore present challenges to workers as their health status is at risk from a number of occupational hazards including injuries and noise. Governments and other stakeholders in African countries need to join forces to develop institutional and legal frameworks, capacity building, research and documentation on work-related hazards and diseases. A decent working life in which workers are not harmed at work will improve their health and positively impact the economy.

15.4 The Mining Industry

15.4.1 Description of Mining

Mining is an important activity worldwide. Many countries have significant natural resources and many workers are involved in their extraction and processing. For instance, it is estimated that 13 million people are in 30 different developing countries to be Artisanal and Small-Scale Gold Miners (ASSMs), and about 80–100 million people are dependent on mining activities for their livelihood. Tanzania alone has more than 550,000 gold miners, of which about 25% are women. The working conditions for the miners are challenging, involving a number of health risk factors. There is also a high risk of accidents and injuries in mines, and workers can be exposed to noise, vibration, ergonomic challenges, dust and chemical hazards, and shift work (Eftimie et al. 2012).

15.4.2 Risk Factors for Health from Working in Mines

There are several health risk factors relating to work in mines. Here, we focus upon three of them; mercury exposure, dust exposure and child labour. Mercury is often used in the extraction of gold. In small-scale mines, mercury is often mixed by hand in ASSM, forming a lump or ball of mercury–gold amalgam. Water is added several times during the process, to help discard tailings and remove lighter particles until only the amalgam remains. The amalgam is then squeezed into a piece of cloth to recover excess mercury as the mercury is often re-bottled and used again. Finally, the amalgam is placed into a small can on a stove or coal pot to roast for 15–40 min, depending on size, whereby the mercury evaporates from the mixture leaving the gold behind. The work results in significant exposure to mercury, both by skin absorption and by inhalation (Mensah et al. 2016). These serious health risks should not be present at a decent work place, without proper protection of the workers.

Miners are also often exposed to dust because the process of extracting minerals involves rock breaking in a series of different operations, either in open cast or conventional underground mines. The ILO has guidelines on the prevention and suppression of dust in the mining industry (ILO 1965). The protection measures described here are either not used, or they are inadequate or ineffective in many mining operations. This is why the prevalence of respiratory problems among miners is still high. In a study done in South Africa, the proportion of gold miners with silicosis increased tenfold from 3% in 1975 to 32% in 2007 (Bio et al. 2007). Silicosis, a serious lung disease caused by inhalation of silica dust, leads to breathing problems and causes disability and even death. It is well documented that coal mining creates high levels of dust, causing serious respiratory health problems such as silicosis and Chronic Obstructive Pulmonary Disease (COPD) among the workers (Mamuya et al. 2007; Nelson 2013). The main work processes of underground mine workers are pneumatic drilling, blasting and lashing of the hard rock materials. Without protective equipment and proper working methods, this type of workplaces causes high dust exposure levels and produces patients with respiratory health problems. This type of work should not be performed without proper protection of workers.

In small-scale gold mining, much of the work is performed by children. Thousands of children, some as young as 8 years old, spend their days digging in pits, most of which are highly dangerous. Some process the gold with toxic mercury. They perform the work as they are small and can access areas not available to adults (ILO 2017). Although labour in the mines is forbidden for children under the age of 18, governments in Africa have often done little to enforce these prohibitions. Labour and mining, in particular, expose children to serious health risks.

15.4.3 How Can We Achieve Decent Work in Mining?

Although the health risks in mining have been known for a long time, the work in many mines is still performed without adequate worker protection. There is a need for special consideration in this type of work. Politicians should work together internationally to create safe mining workplaces. Proper laws should be developed, and efforts infested to ensure their implementation. For instance, mercury use should be much more regulated or completely banned. Also, mine workers need respiratory health control programmes to reduce the risk of developing respiratory diseases (Nelson 2013). In general, all facets of the mining industry, including consumers, must stop supporting illegal and dangerous practices that place children at risk. Domestic traders and international companies should initiate policies in order to eliminate child labour. Regular inspection visits should be organised to all mines to ensure the absence of child workers (ILO 2017). Human rights must take precedence in order to transform the mining industry into an ethical one, and to transform it into an industry that respects the rights of children in Africa and other developing countries.

15.5 The Textile Industry

15.5.1 Description of the Textile Industry

Many African countries are striving to develop cotton processing and garment sectors to contribute substantially to their economic development, provide employment and develop exports of cotton and textile products (Vaid 2011). The main importers of cotton include Asian countries such as China, Bangladesh, Pakistan, Indonesia and Thailand, and European countries. Finished fabrics are exported to USA, UK and European countries. Cotton cultivation provides an important source of livelihood for African growers and families that are organised in small and medium to large farms for cotton processing. Raw cotton is collected from the fields and is then transformed into usable products after being spun into thread through manufacturing processes that involve ginning, spinning and weaving or knitting in factories. These factories are machine

intensive and are involving in various types of work categories. The production of cotton thread starts with bale cotton cleaning and blending, after which the cotton is further processed by carding and drawing sections to straighten and line up the cotton fibres in a form of loose strand of fibres called sliver. The sliver is processed by drawing, roving, ring frame and winding machines that produce the final thread product, which is sent to weaving machines.

15.5.2 Risk Factors for Health at Work in the Textile Industry

In the textile industry, there are many health risk factors. The presence of dangerous machines, cotton dust, noise, heat and ergonomics are all a concern in this manufacturing sector. We will only describe two factors here; dust exposure and manual work. The Occupational Safety and Health Administration (OSHA) Cotton Dust Standard in the US defines cotton dust as the dust present in the air during the handling or processing of cotton (OSHA 2017). This dust is a complex mixture of components, which may include ground-up plant matter, cotton fibre, bacterial, fungi, soil particles or pesticide residues that may accumulate during the growing of cotton plants, harvesting, and subsequent handling, processing or during storage periods. It is the cotton dust constituents that can cause harm to the respiratory system, and can result in serious diseases such as byssinosis and COPD.

The earliest studies on cotton dust exposure were conducted in the 1970–80s in Egypt, when there was a strong movement to evaluate and improve work place conditions (OSHA 2017). The earliest study on dust exposure in Ethiopia was undertaken in one of the oldest textile factories in Bahir Dar in 1986 using area sampling. The results showed 4–17 times the dust level recommended by OSHA (Woldeyohannes et al. 1991). Long-term exposure to cotton dust may lead to a disease called byssinosis. Byssinosis is a set of symptoms expressed chiefly as chest tightness and shortness of breath on the first day of the workweek, developing to daily problems and disability. Byssinosis in Africa is an old problem but one of growing concern. A pioneer study in Ethiopia showed an overall byssinosis incidence of 16% in the workforce, with the highest levels being found in the blowing (43.2%) and carding (37.5%) sections in Bahir Dar textile factory (respiratory problems among cotton textile mill workers in Ethiopia). The prevalence of byssinosis, defined as chest tightness and/or breathlessness, experienced on the first day at work after 2 days off, was 38% among Akaki textile workers in Ethiopia (respiratory problems among cotton textile mill workers in Ethiopia). A recent study in one of the textile factories in Addis Ababa showed a byssinosis prevalence of 26.3% among workers (Alemu et al. 2010). Over the past years, byssinosis has also been described as a problem in Zimbabwe and Nigeria (Alemu et al. 2010).

Ergonomics is another challenging issue for the textile industry. The work is often performed in a standing position, using repetitive motions of the hands and arms in the process of spinning and weaving. This may result in a number of pains and musculoskeletal system problems from workers. It may affect the arms, hands, shoulders, neck and back of the workers (Eraslan et al. 2013). Workers can develop different types of tendinitis, sprains, as well as lumbago and myalgia. In a recent study from India, more than 50% of the workers reported such problems, even though they were quite young (Angeline and Bobby 2017).

15.5.3 How Can We Achieve Decent Work in the Textile Industry

It has been known that cotton dust affects the respiratory health of workers as well as the fact that work in factories may cause musculoskeletal problems for decades. However, these problems still exist in the textile industry today. A sub-target of SDG 8 is ‘to protect labour rights and promote safe and secure environment for all workers’. This target is clearly not being fulfilled in this industry. Creating awareness and knowledge among

policymakers and authorities in developing countries is an important intervention to improve the situation. Together they need to identify possible hazards and their consequence. A possible intervention includes a number of technical solutions that may reduce the strain on the worker's body. If such solutions cannot be found, it is important to know that variation during the work can mitigate strain. Repetitive manual work is not healthy and workers need variation to avoid musculoskeletal problems. The industry owners need to have clear guidelines and expectations from the local authorities in each country to create a decent and healthy working environment. In several European countries, trade unions have been important in implementing the necessary regulations and implementation of them.

15.6 Conclusion

The 'decent work' aim of SDG 8 has several possible interpretations: one is that decent work involves having a workplace where workers are not harmed and where they are shown respect and decent treatment. Work-related diseases and injuries can and must be prevented and industries should produce goods, not patients. This chapter has described and provided examples of some of the health risk factors in workplaces in SSA today. To develop decent workplaces in SSA, it is crucial to ensure access to information and awareness about health and safety for all stakeholders—employers, workers, professionals, inspectors, worker representatives, politicians—and more research needs to be conducted and published. Appropriate policies and legislation must be developed. In addition, incentives for developing a good work environment are needed, as well as sanctions for industries failing to do so. Unions need to be supported in Africa to defend and engage in workers' rights. Today these organisations are small and weak in many African countries (Shillinger 2005). Capacity building in occupational health is necessary and can be undertaken in cooperation with other countries.

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16 Upscaling Agriculture and Food Security in Africa in Pursuit of the SDGs: What Role Does China Play?

Lawal Marafa, Julian May and Vincent Ado Tenebe

Abstract

China and Africa constitute more than a third of the world's population and China has become Africa's largest trading partner. This has led to other forms of engagement with African countries, shaping development policies and outcomes. This chapter focuses on one important set of outcomes: the implications of the China-Africa relationship for global food security and the transferability of the Chinese model of agriculture to African countries. As the world redirects attention to pursuing sustainable development goals (SDGs), such engagements with China in agricultural development will affect the attainment of SDG 1 on eliminating extreme poverty and SDG 2 on achieving zero hunger. China has embarked on an effort to improve African agricultural capacity and productivity partly by sharing experience, technology transfer and by encouraging Chinese agricultural investments in Africa. This has included setting up new exchange frameworks and programmes to both bring Chinese experts to African countries and African students and researchers to China. However, China's engagement with Africa has also raised concerns about new forms of international exploitation and their impacts on sustainable development. This chapter examines possible lessons for African countries from the success of agriculture in China, as well as the potential challenges arising from China's own development priorities, particularly when the Chinese model of agriculture is implemented in Africa.

Keywords

Africa · Agriculture · China · Food security

16.1 Introduction

China and sub-Saharan Africa (SSA) together constitute more than a third of the world's population. While China's population growth has stabilised, that of SSA is set to more than double in the next 35 years, reaching 2.4 billion by the year 2050 (United Nations Department of Economic and Social Affairs (UNDESA) 2015). The combination of a growing population, urbanisation and continued economic growth will increase domestic food demand. Increasing the

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availability and accessibility of safe and nutritious food will be essential to providing global food security. As a result, the success of the sustainable development goals (SDGs) rests upon achievement of the goals in these two regions where a substantial proportion of the world's population resides.

Agriculture plays an important role in the economies of both China and SSA, contributing about 9% and 17% of value added to GDP in 2015, respectively (World Bank 2016). While China has successfully raised hundreds of millions of peasants out of rural poverty in an effort to boost food security and people's livelihoods, many countries in SSA are still grappling with food security issues. China has emerged as the global leader in terms of progress towards MDG 1 (eradicate extreme poverty and hunger). The poverty headcount of people living below the extreme poverty line of US$1.90 fell from 67% in 1990 to 11% by 2010, with rates reaching 5% in the final reporting of the MDGs in 2015 (World Bank 2016; United Nations Development Programme (UNDP) 2015). In contrast, the poverty rate in SSA remained unchanged from 1990 until 2002, and more than 40% of the population was reported to be below the extreme poverty line in 2015.

The success in China was accomplished partly by investing heavily in agriculture and rural development and through the adoption of what has become known as the Chinese model of agriculture. The increasing engagement between China and Africa over the past two decades may present an opportunity for countries in SSA to transfer aspects of the Chinese model to improve their agricultural productivity and, subsequently, their food security. As this engagement is not unilateral, ways of accommodating this relationship for mutual benefit and minimising the challenges and risks of exploitation will need to be found. As scholars and policymakers discuss ways to pursue the SDGs, the questions surrounding the challenges of African agricultural productivity still remain.

Haggblade and Hazell (2010) argue that since the middle of the twentieth century, agricultural performance in Africa has lagged behind other developing regions. Most indicators of agricultural productivity show little improvement. For example, while agricultural value added per worker has almost doubled for all countries in the world, from US$1,149 in 1990 (constant 2010 US$) to US$2,206 in 2015, that for SSA has moved from $774 in 1990 to US$1,240 in 2015 (World Bank 2016). In China, the move has been dramatic, from US$561 in 1990 to US$1,465 in 2015. The impact of these differentials in productivity on food security is evident. While the depth in the food deficit measured in kilocalories per person per day in China fell from 188 kcal in 1992 to 78 kcal in 2015, that for SSA fell from 249 to 133 kcal over the same period (World Bank 2016). The prevalence of undernourishment shows a similar pattern, declining from 33% of the population in SSA in 1991 to 19% in 2015, compared to 24% in 1990 in China, and 9% in 2015 (World Bank 2016).[1] By 2015, China accounted for almost two-thirds of the total reduction in the number of undernourished people in developing countries since 1990 (UNDP 2015).

The issues leading to this slow progress in agriculture and food security have far-reaching implications for sustainable development, inclusive growth, poverty alleviation, food security and industrial development for the African continent. There is increasing interest in, and concern about, the growing engagement of China with Africa. This includes the political influence that comes from the increasing amount of development aid, trade, direct investments, loans and the presence of Chinese nationals on the continent. To determine whether these concerns are justified, it is necessary to understand how Chinese investment and development assistance might affect different sectors, including infrastructure, extractive industries, knowledge production and agriculture. We first discuss the state of agriculture in Africa, and then describe the Chinese model of agriculture before we consider

[1]Derived from the Food and Agriculture Organization (FAO) and based on average food available for human consumption per person, the level of inequality in access to food, and the minimum calories required for an average person (World Bank 2016).

some implications of China–African relations as these relate to agricultural development, and finally propose implications and options for the way forward.

16.2 The State of Agriculture in Africa

Agriculture is a major component in Africa's growth and development, as well as in the livelihoods of its rural and urban citizens. Although its contribution varies widely from 2% of value added to GDP in countries such as South Africa and Botswana to 60% in Sierra Leone (World Bank 2016), agriculture provides an average of around 17% of value added to GDP for the continent (World Bank 2016), and more if downstream processing is taken into account. In the past decades, agriculture has represented close to 40% of Africa's exports while employing over 55% of its labour force reaching up to 90% in countries such as Djibouti, Guinea and Burkina Faso (African Development Bank (AfDB) 2014). Including all forms of agricultural activity, more than 227 million Africans are estimated to derive livelihoods from working on the land (AfDB 2014). Agricultural output has grown slowly, largely due to increases in the land area planted rather than through increased productivity (AfDB 2014). Africa's share of world agricultural exports has also declined over the years (Brüntrup 2011).

The importance of Africa's agriculture in contributing to food and nutrition security, poverty reduction and overall economic growth is well documented (African Union (AU) 2011). However, Africa is now a net importer of agricultural goods, spending about US$50 billion by 2007 (Li et al. 2009; Rakotoarisoa et al. 2011; AU 2011; May 2018). Not only does the continent have the lowest yield of any global region but also huge tracts of land remain unutilised. Africa has 25% of the world's arable land, yet it generates only 10% of global agricultural output (Jayaram et al. 2010). In addition, land that is under cultivation is lagging in the use of technology and new farming systems. Only 10% of the cropped land is prepared by tractors and only 4% of the land is under irrigation (Sachs et al. 2001).

According to the Food and Agriculture Organization (FAO), only 14% of Africa's total 184 million hectares of arable land is under cultivation, with 93% of that dependent upon rainfall and low fertiliser usage (Alden 2013). The World Bank estimates that 60% of world's uncultivated land is in Africa and of the 400 million acres that can be used for agriculture, less than 10% is currently cultivated, while the African Development Bank reports that over half of the world's fertile yet unused cropland is found in Africa (AfDB 2014).

The challenges of Africa's agriculture range from widespread degradation of the soil and natural vegetation to lack of skills and neglect by the political leadership. In addition, many governments and donors have scaled down their budget allocation for agriculture (Adesina 2017). In a keynote address at the Forum for the Future of Agriculture in Brussels, Belgium, in 2017, Kofi Annan asserted that while scientific and technological breakthroughs have led to impressive increases in agricultural productivity and reduced hunger around the world, some do not have enough food to eat and another two billion may eat, but their meals lack the nutrition necessary for proper health and development, issues first observed by Oniang'o et al. (2003). Despite this, the potential for improving yields in Africa remains high. For example, yields of dryland crops such as sorghum, millet, groundnut and cowpeas could be easily increased by more than 300% with appropriate land preparation, timing of planting, and use of pesticides and fertilisers (Alden 2013).

With the emergence of a new dynamism in the leadership of Africa, the African Union (AU) adopted the Comprehensive African Agriculture Development Programme (CAADP) in 2003 as a new impetus for Africa's agricultural policy (AU 2011; Brüntrup 2011). The AU identified this programme as a policy objective for engagement with development partners including China. CAADP represents a viable framework that has inspired and energised

African agricultural research institutions, farmers' associations, African governments and the private sector who believe that agriculture has a pivotal role in development. As earlier indicated by Mr. Annan, history has shown that increasing agricultural productivity is a critical driver of economic transformation and social development. While this is a challenge, it also constitutes a potential yet to be utilised.

The SDGs bring further hope for renewed attention to the agricultural sector. Although the SDGs span a range of policy areas, from rural poverty, global hunger, climate resilience, water resource issues and population growth, nine of the goals are directly or indirectly related to food security, thus conferring a special multidimensional status to agriculture. Africa has clear agricultural potential, which is important for the attainment of most of the SDGs, but particularly SDGs 1 and 2.

This potential has been recognised by China and its government has identified and established partnerships on the continent aimed at 'global food security' and effectively addressing SDG 2. The emerging China–Africa cooperation is an opportunity to upscale benefits in rural development in Africa. The Forum on China Africa Co-operation (FOCAC) process established in 2000 offers a concrete way to take this forward.

16.3 The Chinese Model of Agriculture

In China, the per capita food production has risen by a factor of about 3.6 since the 1960s. As an example, Chinese grain production per capita increased from a little over 100 million tonnes in 1949 to over 500 million tonnes at the eve of the millennium (National Bureau of Statistics of China (NBSC) 2009). While China feeds 20% of the world's population on 9% of its arable land, Africa is unable to fully feed 15% of the world's population on what is one-quarter of the world's arable land. It is this success achieved by China that is relevant to the China–Africa relationship, focusing on agriculture and rural development.

China's agrarian revolution was achieved on the back of small-scale farmers and the steady introduction of commercial farming methods (Fan et al. 2010). Sun (2011) argues that China's economic reform started in the agricultural sector and led to rapid agricultural growth and poverty reduction. It has been a strategy that resulted in the success of poverty alleviation and rural development. China demonstrated that poverty and hunger can be mitigated and significantly reduced by empowering the agricultural sector in the process of economic development. According to Chaponnière et al. (2011), China has 200 million farms covering an average of about 0.6 ha each. In articulating a Chinese agricultural model, significant investments in rural infrastructure were made and an intensive literacy campaign targeted at farmers was undertaken. These initiatives were followed by the liberalisation of pricing and markets in the 1990s.

Over the past three decades, Chinese agriculture has sustained high growth rates. For example, the outputs of grains increased by 64% (Yu and Zhao 2009). On the other hand, the grain acreage shrunk and decreased by 12.4%, due to land degradation, desertification, urbanisation and other reasons. Many of these challenges are also prevalent on the African continent. Accepting the challenges of Chinese agriculture, the government established a model of operation that enhances agricultural productivity.

The lessons and experiences of the Chinese model of agriculture include: (1) the promotion of chemical fertilisers. China subsidises fertilisers to stimulate farmers to use more fertilisers to improve yields; (2) the government intensified efforts to increase the educational level of farmers and introduced them to new varieties, farming systems and other useful methods of farming; (3) by investing in land resource issues and enhancing the farmer income, rural poverty was reduced, allowing the farmers to continue to play important roles in agricultural productivity; (4) there are large targeted investments on input increases (fertilisers, pesticides), technical improvement and institutional changes that enhance agriculture and (5) policy experiments

are conducted to assess policy options (Yu and Zhao 2009; Carter 2011; Kai and Shoemaker 2018; Husain 2015). These experiences suggest the potential to explore the application of the Chinese model to the African agricultural sector through China–Africa engagement, a notion that was recognised in the 2014 African Transformation Report (African Centre for Transformation (ACET) 2014).

16.4 China–Africa Relations: Implications for Agricultural Development

Relationships between China and Africa date back to fifteenth century when the explorer Zheng He sailed to East Africa (Strauss 2009). The transition from this early contact to the economic and political engagement in the last few decades represents a revitalised engagement in businesses, trade and economic development (Marafa 2009; Adisu et al. 2010). China is now a leading international investor in Africa, in particular in the agricultural sector.

Historically, China's interest in African agriculture dates back as early as 1959, when the People's Republic of China sent an allocation of food aid to newly independent Guinea (Li et al. 2009). Since then, and in line with the 'Eight Principles of Foreign Economic and Technological Aid', there has been a steady transition from the provision of aid without overt political condition attached to direct investments as is currently the case (Amanor and Chichava 2016). These now include the establishment of state farms with agri-processing capacities, irrigation projects and some demonstration farms showcasing Chinese technologies (Brautigam and Xiaoyang 2009).

China's policy on Africa changed in the early 1980s following the historic decisions that were taken to transform China's economy during the 12th Conference of the Chinese Communist Party in 1982. From 1987, further reforms affected China's international investment strategy when the financial subsidy for foreign trade exports was cancelled and foreign trade enterprises were required to take responsibility for their profits and debts. This allowed some of them to set up joint ventures and cooperative enterprises outside of China (Davies 2013). In the 1990s, the 'Going Abroad' policy further emphasised trade and investment while the 'two resources and two markets' tactic provided incentives for Chinese enterprises to invest in African countries.

The process to formalise the various trade and investment relationships between African countries and China started during the 1990s as political and economic engagements became more frequent. Li et al. (2012) suggest that the push for this came from African leadership who called for a multilateral forum. The Forum on China Africa Cooperation (FOCAC) was established in 2000 with this purpose in mind, and the first Forum met in Beijing in October of that year, attended by nearly 80 ministers from 44 African countries.

Chinese leaders have maintained that raising the level of African agricultural productivity is in the interests of the whole world. At the FOCAC Johannesburg Summit in 2015, Chinese President Xi Jinping announced the 'Ten China-Africa Cooperation Plans', among which the China-Africa Agricultural Modernisation Plan is one of the most important components. It was underlined at the meeting that Chinese investments have the potential to change agriculture on the continent.

In an effort to further encourage investment in Africa, in June 2010, China's top state-owned agribusiness group, China National Agricultural Development Corporation Group (CNADC) and the China-Africa Development Fund, set up a joint venture, China-Africa Agriculture Investment Co. Ltd. (CAAIC). Funded at RMB1 billion (US$161 million), CAAIC was intended to be a platform to promote China's farming, fishing, animal husbandry, livestock and agro-processing and marketing investments in Africa (Brautigam and Zhang 2013). Furthermore, China's 12th five-year plan (2011–2015) encouraged Chinese firms to build productive capacity in developing countries with comparative advantage in agriculture, as part of the

'going global' strategy. The China-Africa Development Fund in 2007, which was created in 2007 with an initial investment of US$5 billion, has been used to further Chinese investment in Africa, growing to US$10 billion by 2018. The fund has since provided almost US$4.6 billion for over 90 projects in 36 African countries, covering projects in infrastructure, equipment, agriculture, people's livelihoods as well as energy and resource development.

By 2012, China had become Africa's largest trading partner. Between 2005 and 2017, China invested in 293 foreign direct investment (FDI) projects in Africa, totaling an investment of US$66.4 billion and creating 130,750 jobs (Ministry of Commerce of the People's Republic of China (MOFCOM) 2014). According to Ernst and Young (2017), China's exports to Africa in 2016 stood at US$82.9 billion while imports from the continent were valued at US$54.3 billion. Although China's official data on outward foreign direct investment (OFDI) are often difficult to interpret, Table 16.1 depicts the trend of China's investment in Africa. While most of the data are sourced from the MOFCOM, they are largely corroborated by others like the NBSC. While the trends in the data are modest and reflect some exponential growth, investment fell slightly—by about 7%—in 2015 when compared to 2014. Table 16.1 identifies the top five African trading partners with China and the top five African exporters to China.

As China scaled up its engagement with Africa, bilateral trade expanded to more than US $166.3 billion by 2011. Agricultural trade, however, accounts for just 4% of total China–Africa trade (Dollar 2016), and China exports more food products to SSA than it receives. Of China's total agricultural imports from Africa, the majority are non-edible goods such as hides and skins, wood, cotton and tobacco.

This shows that there is significant potential for increased agricultural trade should African countries be willing to adopt policies and accept investments that would further promote such export crops and commodities. Such policies would make these agricultural goods attractive to both China and other international markets, as well as markets across the continent. However, this could come at the cost of increasing food insecurity as cash crops displace domestic food crops. It would also encourage the consolidation of land holdings by local elites. Examples of existing investments in farming by China in selected African countries are given in Table 16.2 (Brautigam 2014).

Table 16.1 Chinese outward direct investment and foreign direct investment in Africa (in millions of US$) (Lane and Milesi-Ferretti 2007; MOFCOM 2014)

Country/region	OFDI 14	OFDI 11	FDI 11
Africa	32,350.07	16,244.32	628,574.00
South Africa	5,954.02	4,059.73	134,391.56
Algeria	2,451.57	1,059.45	22,281.82
Nigeria	2,323.01	1,415.61	76,113.10
Zambia	2,271.99	1,199.84	10,927.00
Congo, Dem. Rep.	2,168.67	709.26	5,589.95
Sudan	1,747.12	1,525.64	45,845.23
Zimbabwe	1,695.58	576.44	2,201.45
Angola	1,214.04	400.59	12,147.80
Ghana	1,056.69	270.15	14,510.95
Congo, Rep.	988.76	142.40	19,726.24

As China continues to make inroads into Africa for investment, it can also provide markets for African agricultural products. China is currently the second largest food consumer in the world. Although it is currently meeting its domestic demand, it is already considering long-term strategies, given that it continues to be confronted by diminishing local resources in arable land and irrigable water. Africa, therefore, with abundant unused arable land, water and energy resources, may well fall into China's long-term plan to address food security needs, if appropriate agricultural policies and actions are put in place to facilitate production for both local consumption and export. While Adisu et al. (2010) have reported that Chinese investment in Africa has negatively affected local companies, others criticise China's interest in Africa's agriculture as economic colonisation that includes land grabbing in some countries (Borras and Franco 2012).

Table 16.2 MOFCOM-approved Chinese farming investment proposals, Africa (MOFCOM 2014)

Country	No. of Chinese companies (total)	No. of Chinese companies (farming sector)	Grain crop (corn, rice, cassava, etc.)	Cash crop (sisal, sugar, rubber, etc.)	Livestock (Chickens, eggs, etc.)
Nigeria	270	6	4	4	4
South Africa	175	4	2	3	3
Zambia	158	16	16	10	16
Ethiopia	130	2	1	2	1
Ghana	115	2	1	2	N/A

Raising productivity was, and remains, the key focus of China's technical assistance programme (Li et al. 2009; Xu et al. 2016). Raising Africa's agricultural productivity will not only enhance the livelihoods of rural communities in Africa, but it can address a growing problem of food security in China itself (United Nations; Economic Commission for Africa (UNECA) 2007). Looking back to the start of FOCAC in 2000, China' FDI in Africa was about US$220 million and has continued to rise (Fig. 16.1). As shown in Table 16.1, China's investment share in GDP in Africa appears to be growing exponentially. While this is the case, Fig. 16.1 shows some fluctuation in numbers with a slight decrease from 2013, which was the highest year by investment volume.

According to reports, by 2010, China's involvement in the agricultural sector had attracted an FDI of about US$30 million, about 2% of China's total FDI to Africa at that time (Moyo et al. 2015). At the FOCAC summit of 2015 China also committed to carry out agricultural development projects in 100 African villages to raise rural living standards. Investing in African people holds the possibility of

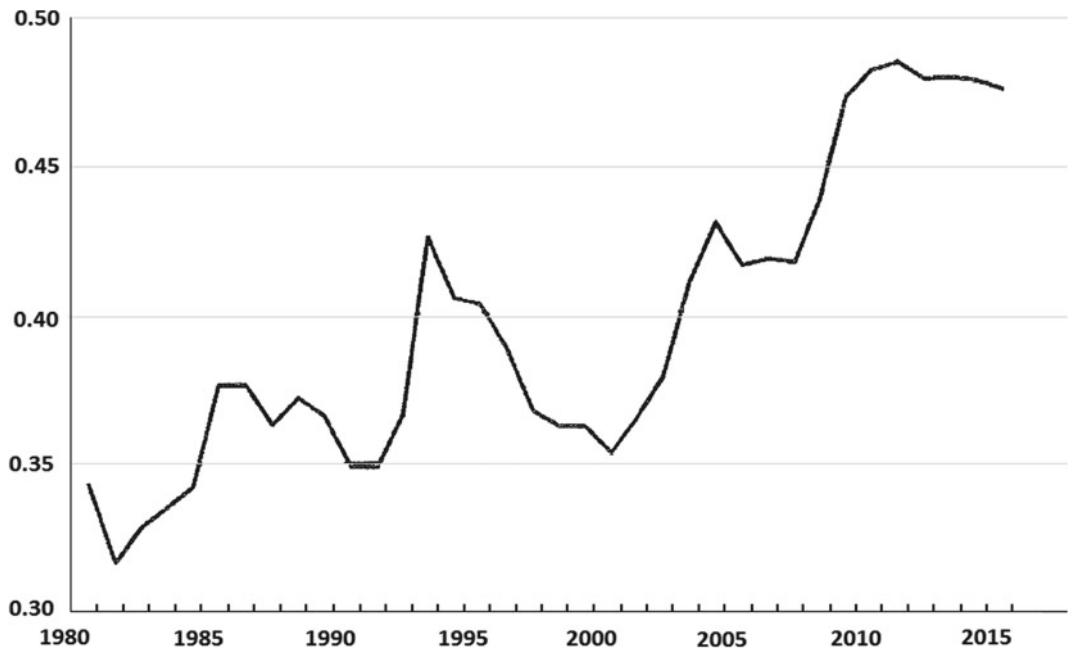

Fig. 16.1 China's investment share in GDP, 1980–2015 (NBSC data. Accessed 28 June 2016)

considerable returns. This includes rural farmer education, establishing modern farming demonstration centres, better quality seeds, new technology in farming machinery, and soil improvement techniques (Xu et al. 2016).

As China opened up and eventually joined the World Trade Organization (WTO), the relationship with Africa involved establishment of research and technology centres, production, extension and trade (Gu et al. 2016; Xu et al. 2016). Since 2004, China has sent more than 900 agricultural experts and technicians to Africa and trained 4,200 agricultural management officials and technicians. Chinese agricultural professionals are also helping to establish agricultural demonstration bases in Africa (Xu et al. 2016), and fourteen demonstration centres for agricultural technology have been constructed (Tugendhat and Alemu 2016). China has organised training on issues such as the cultivation of rice, vegetables, poultry, meat processing and use of agricultural machinery promoting both small-scale and commercial farming models that have proven successful in harvests.

16.5 Africa, China and the SDGs

As indicated by Chaponnière et al. (2011), it is important to note that, although Chinese agriculture enjoys high yields, the farmers themselves are poor because their productivity is one-sixth that of non-agricultural activities. While Chinese agriculture is essentially a commercial activity, this is not the case with African agriculture, which is far more often related to subsistence. The onus is on Africa to transform this sector and seize the opportunity to modernise and commercialise.

Coincidentally, the launch of the MDGs came at a time when FOCAC was created. FOCAC provided a platform for dialogue between China and the African continent at policy, ministerial and other levels. In the FOCAC plan of action and the China–Africa policy document, almost all MDG goals were covered, particularly poverty reduction, human resources, health care and food security. As the focus shifted to development beyond 2015, it was clear that the China–Africa relationship and, in particular, the role that FOCAC played was visible in most aspects of economic development, infrastructure and livelihoods.

With the experience that China amassed in the implementation of the MDGs, coupled with the activities on Africa as facilitated by FOCAC, it is possible to link China–Africa cooperation and the 2030 Agenda. As the SDGs have evolved, it is clear that both China and Africa provided vision and prospects for long-term development initiatives. Such initiatives were successfully enumerated in China's position and the Common African Position (CAP) on the post-2015 Development Agenda that were respectively presented in 2014. The CAP was published by the United Nations Economic Commission of Africa (UNECA) and enumerated Africa's readiness to reach consensus on common development challenges, identify priorities and underline the aspirations of the continent. It also pledged to actively participate in global debates on addressing emerging development issues. As a prelude to the reports, the Chinese leadership conceptualised the Chinese Dream aiming for national rejuvenation and people's happiness, while the African Union unveiled its Agenda 2063 for generating a positive socio-economic change in Africa over the next 50 years.

The relationship that Africa has built with China in agriculture has created spaces for new critical engagements, giving Africa more choices and the ability to influence development policies (Cheru et al. 2014) as regards to agriculture. China and Africa have committed to the SDGs and are seeking to enhance various types of cooperation with a specific interest in agriculture. The processes and results are set to make major interventions in SDGs 1 and 2. To do this, the Chinese investments in agriculture are gradually building commercial agricultural services and inputs with the possibility of raising the living standards of local farmers (SDG 1) and making food more available (SDG 2). Although many of China's activities in Africa predate the 2030 Agenda, they are relevant to achieving the successes of the SDGs, particularly in agriculture.

16.6 Conclusion

Although over the past few decades, China has been engaged in African agriculture, the nature of such engagement has remained complex (Cassell 2013). While negative effects of China's involvement in African agriculture have been identified (such as land grabbing as indicated by Borras and Franco 2012), it is also argued that China has done more to alleviate poverty in Africa than anything attempted by some governments or the initiatives of traditional partners (Cassell 2013). This engagement thus presents an opportunity for African countries to benefit from the experiences of successful food production and establish food security, poverty alleviation and rural development.

The Chinese engagement will be more meaningful if Africans are careful to manage it well. African policymakers must clearly define their development objectives and engage China with those objectives in mind. CAADP is a good place to start defining Africa's agriculture policy objectives for engagement with China or other development partners. African policymakers should seek to break down market barriers, both domestically and regionally. Africa can also use China's assistance to develop its agricultural sector and the associated infrastructure to encourage a more efficient market structure. Chinese investments have the potential to change agriculture permanently on the continent. Chinese aid could be used to develop crops suited to both African and Chinese demands. The governments of Africa need to learn how best to exploit this opportunity.

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17 Contextualising Accountability and Responsible Production and Consumption in the Extractive Industries of West Africa

Innocent I. Okwuosa and Sharif S. Khalid

Abstract

Many African countries have embraced the Sustainable Development Goals (SDGs). However, little attention has been paid to accountability in relation to responsible consumption and production advocated by SDG 12, especially in the extractive industry of West Africa. The authors critically engage with two existing accountability mechanisms, namely, the International Financial Reporting Standard (IFRS) and the Global Reporting Initiative (GRI) to highlight their limitations in respect of accountability relating to SDG 12 in the extractive industry of West Africa, using Nigeria and Ghana as reference points. We also highlight the limitations of a set of indicators being promoted by the United Nations Conference on Trade and Development (UNCTAD) as an accountability mechanism for SDGs, especially responsible production and consumption. We argue that a better accountability mechanism for SDG 12 should prioritise those indicators that show how production and consumption in the extractive industry do not result in (1) loss of life and displacement from land for the local communities and (2) spillages that destroy the land, water and air, depriving the local communities of their means of livelihood and causing health problems.

Keywords

Accountability · Extractive industry · Local communities

17.1 Introduction

In 2015, United Nations member states, including those from Africa, adopted the 2030 Agenda for Sustainable Development, which contains 17 Sustainable Development Goals (SDGs). While these countries have embraced the SDGs, not much attention has been paid to the operation of large corporations and their accountability for responsible consumption and production, as emphasised by SDG 12: 'Ensure sustainable consumption and production patterns'. Specifically, SDG 12.6 advocates the need for multinational corporations (MNCs) to adopt sustainable practices and requires them to publish sustainability reports. One of the authors of this chapter participated in the discussion session of what may be regarded as an initial effort to develop a mechanism for SDG accountability as proposed by the United Nations Conference on Trade and Development (UNCTAD) during the thirty-fourth session of Intergovernmental Experts on International

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Standards of Accounting and Reporting (ISAR 34), held in October 2017 in Geneva. The purpose of this chapter is to critically engage with existing general accountability mechanisms for responsible consumption and production (IFRS and GRI), as well as that proposed by UNCTAD ISAR 34 within the context of extractive industries in West Africa. The oil industry in Nigeria and the mining industry in Ghana are used as reference points, given their importance to the respective economies of these countries as well as their social and environmental impact that may pose a challenge to the achievement of SDG 1 (no poverty), SDG 2 (zero hunger) and SDG 3 (good health and well-being) for certain local communities in both countries.

The chapter is structured as follows: after the introduction, the concept of accountability is discussed; then the social and environmental impacts of the operations of the MNCs in the oil industry of Nigeria and mining industry of Ghana are outlined. Following this, we engage with existing accountability mechanisms through financial and sustainability reporting, arguing that—in the face of social and environmental impacts of such MNCs—these mechanisms have been inadequate for transparent accounting of responsible consumption and production as advocated by SDG 12. We then critically discuss the accountability mechanism proposed by UNCTAD ISAR 34, arguing for certain improvements to it.

17.2 On Accountability?

The contested nature and definition of accountability involve debates about its aporia (McKernan 2012) and limits (Messner 2009; Joannides 2012). This chapter focuses on how accountability ought to be practised in relation to SDG 12 by MNCs in the extractive industry of West Africa, given the vulnerable circumstances of local communities in this environment (Belal et al. 2013). In its broad sense, accountability refers to 'giving and demanding of reasons for conduct' (Roberts and Scapens 1985, p. 447). It is a requirement to give an account of oneself and of one's activities (Joannides 2012). To this end, it is generally agreed that accountability refers to the responsibility expected from a person, an entity or institution, to give an account of their conduct (Roberts and Scapens 1985). It is within the context of information, rights and responsibilities that it is made manifest. Gray et al. (1996) conceptualise accountability as intertwined with the right to information and define it as the duty of an entity to provide an account of those actions for which the entity is responsible for. Finally, Gray (2007) sees accountability as arising in the economic, social and environmental aspects of corporate operation.

We argue that, if there is to be accountability in relation to SDG 12, which advocates for responsible consumption and production, it must factor in the social and environmental impact of the operation of MNCs in the extractive industry of West Africa. This is because, in a Western democratic context (where most MNCs originate), people have rights to information about that which affects them (Gray 2007). Therefore, given the social and environmental impact of MNCs' operations in pursuit of their economic activities, 'the local communities are due an accountability' (Gray 2013, p. 465). This makes it imperative to interrogate the mechanisms through which MNCs engage in any form of accountability. The key question therefore is whether present mechanisms account sufficiently for the social and environmental impact of MNCs in the extractive industry. First, we consider the impact of the oil industry in Nigeria, before examining mining in Ghana.

17.3 The Social and Environmental Impact of Oil MNCs in Nigeria

Prior studies on the social and environmental impact of MNC operations in the oil industry of Nigeria have documented environmental pollution through oil spillage and gas flaring, resulting in destruction of ecosystems, human rights violations, including the right to life, water, livelihood, education and work (Isichei and Sanford 1976; Akpan 2006; Amnesty International 2009; Idemudia 2009; Steiner 2010; United Nations; Environment Programme (UNEP) 2011; Pegg and Zabbey 2013; Fentimana and Zabbey 2015;

Denedo et al. 2017). Early concern about gas flaring dates back to the mid-1970s. For example, Isichei and Sanford (1976) provide evidence of adverse effects on vegetation of waste gas flaring. Recent studies show gas flaring has been found to contribute to eye irritation, skin rashes, respiratory disease and cancer, and damage to biodiversity due to acid rain, constant noise and heat (Social Action 2009).

Other research has focused on oil spillage. For example, Steiner (2010, p. 4) claims that '… over the 50-year history of oil operations in the Niger Delta, some 9–11 million barrels of oil have been spilled'. Similarly, Amnesty International (2009, p. 16) suggests that people living in the Niger Delta have experienced oil spills every year over the last 50 years on par with that of the 1989 Exxon Valdez at Alaska. Such oil spills were left untreated for months and any subsequent effort at remediation has been ceremonial, the result being an ecological wasteland in this region (Amnesty International 2009; UNEP 2011).

Pegg and Zabbey (2013) highlight the destructive impact of the oil spills on the environment, water quality, local incomes, employment, livelihood structures and community development, focusing on fishing and its ancillary industries. The level of oil spillage is considered massive with catastrophic and devastating effects (Denedo et al. 2017). The most comprehensive assessment of oil companies' operational impact in the Niger Delta (UNEP 2011) shows that oil pollution is widespread in Ogoniland. The UNEP report found extensive petroleum hydrocarbon pollution in many land areas, sediments and swamps as well as groundwater being exposed to hydrocarbons spilled on the surface. Specifically, the data showed that contamination often penetrates deeper than 5 m and had already reached the groundwater in 49 cases covering many locations. Investigations at ten out of the 15 Shell Petroleum Development Corporation (SPDC) remediation sites that were recorded as being complete, reported that there was still pollution exceeding the SPDC (and government) remediation closure values. Hydrocarbon pollution therefore was observed to have exceeded Nigerian national standards.

The UNEP report found that oil pollution was found to have denuded vegetation of its leaves and stems in many intertidal creeks, leaving roots coated in a bitumen-like substance. The immediate result of this is damage to root crops such as cassava and yam and a reduction in their yield when planted in contaminated soil compared to uncontaminated ground. Floating layers of hydrocarbon contaminated the water surfaces of intertidal creeks as well as deeper water, causing destruction of the fish habitat. This has resulted in fish leaving polluted areas in search of cleaner water. The wetlands around Ogoniland were found to have been highly degraded and face disintegration.

In terms of human health, the UNEP report shows that the Ogoni community is exposed to petroleum hydrocarbons in outdoor air and drinking water, sometimes at elevated concentrations, as well as through dermal contact with contaminated soil, sediments and surface water. People may have lived with this chronic oil pollution throughout their lives. No wonder there is a view that the oil spills have resulted in serious health risks as the local community has been exposed to polluted air, rivers and damaged land, which has contributed to elevated incidences of diseases such as respiratory disorders, skin conditions, gastroenteritis and typhoid (Amnesty International 2009; UNEP 2011).

Above all, the Ogoni community has been deprived of their very means of livelihood which revolves around fishing and farming through the impact of oil spills on vegetation and fish habitat. This deprivation, some have argued, even extended to the social and cultural way of life of the local people. For example, the study by Fentimana and Zabbey (2013) on the impact of the 2008 oil spills at Bodo shows that it spans many facets of the economic, social and cultural life of the local community. For instance, the community waterfront can no longer be used for some traditional belief ceremonies or recreational purposes.

17.4 The Social and Environmental Impact of Mining MNCs in Ghana

In Ghana, the activities of the mining industry have also been associated with much social and environmental damage. For example, the growth of the industry has over the years succeeded in destroying forest and farmlands, culminating in deforestation, noise, land, air and water pollution from cyanide and mercury use (Addy 1998; Singh and Koku 2005; Kumah 2006). Summarising the consequences of the mining industry in Ghana, Kumah (2006, p. 320) concludes that, 'the overall cost of the industry in social and environmental terms exceeds the benefits to local communities'.

The accelerated development of the mining industry in Ghana has resulted in numerous sociocultural problems, with mass community dislocation and loss of livelihoods featuring prominently among other ills (Kumah 2006; Hilson and Yakovleva 2007). Environmental degradation has continued to be a key challenge in this industry. According to *Mining News* (1990), there is evidence of cyanide spills and leakages in the Wassa areas of the West Region of Ghana, which persist to this day. These spillages caused by a mine operated by Bogoso Goldfields destroyed rivers such as the Anikoko and Bodwire. River Angonabe was also affected by activities of the Teberebie Goldfields in June 1996.

In terms of human health, inhalation of quartz dust from gold-bearing rocks has resulted in high rates of silicosis and tuberculosis among local Ghanaian mining communities. Coupled with this is the incidence of certain types of skin cancer within the mining communities. Kumah (2006) noted that in the Amansie District, there is evidence of some residents contracting a disease that affects skin pigmentation, referred to as Buruli ulcer. This disease is common in the mining countries such as Australia and Burundi, where the name 'Buruli' originated (Kumah 2006, p. 321).

Local displacement and its impact on social life is endemic. A spill at a mine operated by Ashanti Goldfields Corporation (AGC) in 1998, for instance, displaced the local mining communities of Dokyiwa, Hia, Finaso, Penipa, Ewiase, Badukrom and Ntonsoa (Kumah 2006). According to Kumah (2006), mining relocation schemes have led to loss of land and resources and have resulted in chronic impoverishment, among other social ills. He supports this with evidence from a case where the American Ghanaian Teberebie Goldfields Ltd. displaced locals at Teberebie in the early 1990s.

There have also been several reported instances of human rights abuses by MNCs. For example, the Ghanaian Human Rights Commission report of 2000 implicated Ashanti Goldfields in human rights abuses in Sansu (Kumah 2006). Evidence documented in the report implicated the military, police and security personnel in killings of three artisanal miners between 1994 and 1997. Oxfam (2004) also documents cases of arbitrary arrest and intimidation by security personnel.

It has also been observed that the complex nature of mineral rights allocation and the land tenure system in Ghana offers preferential treatment to MNCs over small-scale miners. This causes tensions between these key actors of the sector from time to time (Hilson and Yakovleva 2007). This has resulted in pressure on government by MNCs to deal with 'galamsey', invariably resulting in 'swoops' that constitute human rights abuses (Hilson and Yakovleva 2007; Kumah 2006). 'Galamsey' is local slang for 'gather them and sell', a term used for local and small-scale artisanal mining.

17.5 Accountability Mechanisms

It is against the above background that the mechanisms of accountability for responsible consumption and production by MNCs in the extractive industry of West Africa are discussed. We first focus on two mechanisms: financial reporting through IFRS and sustainability reporting through GRI, before discussing the proposal by UNCTAD.

17.5.1 IFRS Financial Reporting: Limited Accountability

Most of the MNCs in the extractive industry have adopted IFRS—described as 'one of the most significant regulatory changes in accounting history' (Daske et al. 2008, p. 1086). As such, the IFRS serves as a mechanism employed by MNCs in preparing and presenting financial statements which, according to Gray (2007, p. 176), 'are designed to discharge elements of economic accountability of the organization…'. Unfortunately, this economic accountability is to shareholders, not to local people. The aspect that would have been of value to the local people is omitted. The IFRS would better serve economic accountability if it assisted assessment of the extent to which activities of MNCs disrupt or displace local communities from the economic livelihoods that the land, water and air provide them, such as fishing, agriculture or farming (Deegan 2013).

As Gray (2013, p. 463) argues '… the contamination of land or the release of pollution are of interest to financial accounting—not because they are … inappropriate, … but only to the extent that they may begin to affect the numbers in the financial statements' for shareholders. Thus, IFRS financial reporting may not be useful in relation to accountability for responsible consumption and production advocated in SDG 12. This explains why, despite the adoption of IFRS financial reporting, these MNCs continue their economic dislodgement, not caring about the rights of local communities (Denedo et al. 2017).

17.5.2 GRI Sustainability Reporting and Accountability

The other accountability mechanism which attempts to consider the rights of the local communities is sustainability reporting (Unerman et al. 2007; Gray 2013). According to GRI (2017, p. 3), 'a sustainability report conveys disclosures on an organisation's impacts—be they positive or negative—on the environment, society and the economy'. There is evidence that over 80% of companies worldwide now publish sustainability reports (KPMG 2015), which are used as a measure of corporate accountability within accounting literature (Gray 2007; Unerman et al. 2007). Such reports are guided by the GRI framework which is acknowledged to be the most widely used framework for sustainability reporting (Moneva et al. 2006). Thus, by reporting on sustainability using the GRI framework, it may be assumed that MNCs in the extractive industry of West Africa truly engage in accountability and enable society to assess their operations in relation to SDG 12. Such accountability should make it possible for the MNCs to become more conscious of the social and environmental impact of their operation (Gray 2007).

The disclosure metrics stipulated in the latest GRI framework (GRI G4.), published in 2017, appear to address accountability. For example, GRI G4 contains disclosure metrics around social and environmental impacts of corporate operations. Specifically on environment, one of the metrics, GRI G4 EN24 requires disclosures of the number and volume of significant spills; for spills reported in the MNCs financial statements, the following additional information for each of such spill is required: (1) location of spill, (2) volume of spill (3) material of spill, categorised by (a) oil spills (soil or water surfaces), (b) fuel spills (soil or water surfaces), (c) spills of wastes (soil or water surfaces), (d) spills of chemicals (mostly soil or water surfaces), (e) other (to be specified by the organisation) and (4) report the impacts of significant spills. In addition to the above, G4 HR8 requires disclosures around the total number of identified incidents of violations involving the rights of local peoples during the reporting period.

One is tempted to ask in which sustainability reports are oil spills and cyanide leakages reported by MNCs in the extractive industry of West Africa? Which sustainability report discloses the displacement of a local community as a result of MNCs' operation? A closer reading of the 2017 sustainability report for Shell BP in Nigeria and Ashanti Gold in Ghana reveals only pictures of positive—and no negative—impacts of their operations. This may explain why critics have questioned whether sustainability reporting using

the GRI framework will ever achieve SDGs. A few studies have stressed the opacity of sustainability reports, their questionable connection with the firm's real situation and their often-superficial nature (Gray 2010; Moneva et al. 2006). The reporting process does not necessarily help improve sustainable development performance or strengthen the company's commitment to sustainability (Cho et al. 2010). Some researchers find that the disclosed information tends to reflect business interests rather than a genuine concern for accountability (Gray 2006; Cho et al. 2010). By employing optimistic rhetoric, sustainability reports can even camouflage the fundamentally unsustainable nature of some of the firm's activities and the absence of a substantial commitment to sustainability (Moneva et al. 2006; Gray 2010).

For example, Boiral (2013) through counter-accounting shows that sustainability reporting using the GRI framework fails to disclose about 90% of the significant negative events of corporations, contrary to the framework's principles of balance, completeness and transparency. Moreover, the pictures included in these reports showcase various simulacra clearly disconnected with the impact of business activities. Similarly, Moneva et al. (2006) have criticised the GRI framework for concealing the impact of corporate activities on the environment. We argue for a full disclosure of how the activities of the extractive MNCs impinge on the rights of the local communities. Thus, sustainability reporting using the GRI framework appears inadequate for accountability in respect of responsible consumption and production advocated in SDG 12.

17.6 Towards Accountability Mechanisms for Responsible Consumption and Production in the Extractive Industry of West Africa

We have critically examined two accountability mechanisms, IFRS and GRI, that can be employed to measure the achievement of responsible consumption and production in the extractive industry of West Africa as advocated by SDG 12, showing their limitations for such task. The latest attempt at developing a mechanism for SDG accountability is a set of indicators being promoted by UNCTAD in a document titled 'Core indicators for company reporting on the contribution towards the attainment of the Sustainable Development Goals' (UNCTAD 2017). What is good about the document is that it aims at identifying a limited number of core SDG reporting indicators that are universal—applicable to all corporations regardless of their type of business, industry or geography, including single companies using existing frameworks to ensure comparability. To aid this comparability there is emphasis on quantification and consistent measurement of the indicators. We consider these indicators a good starting point for SDG accountability.

However, we differ on the prioritisation and nature of the few selected indicators as being suitable for accountability and gauging the contributions of corporations towards achieving SDG 12. For example, the economic indicators, such as revenue, payment to government and expenditure on research and development, do not equate to the economic well-being of the local communities as measured by SDG 1, 2 and 3. The remaining indicators, such as community investment and percentage of local procurement may count towards these SDGs but they are not adequate to address quantifiable losses arising from economic displacement of local communities, a major contribution to poverty, hunger and ill health of these communities. Environmental indicators such as greenhouse gas emissions, renewable energy, energy efficiency, water recycling, waste recycling and management are not the most important environmental concerns of local communities when compared to oil or cyanide spillages. Social indicators such as gender equality, research and development, human capital, employee health and safety and collective agreements are of little value since the local communities are often not employees of these MNCs at the time of their displacement.

A mechanism of accountability for responsible consumption and production (SDG 12) must

prioritise those indicators that show how production and consumption in the extractive industry does not result in loss of life and displacement from land for the local communities or spillages that destroy the land, water and air, depriving communities of their livelihoods and causing health problems. Where there is any form of displacement, adequate compensation must be provided. Thus, a mechanism of SDG accountability for responsible consumption and production in the extractive industry of West Africa should be through such priority indicators as (1) total number of incidents of violations involving the rights of local people to life during the reporting period, (2) total number of families displaced as a result of extractive activities, (3) total number of injuries and deaths from disputes with local communities, (4) total monetary value of compensation paid for displacement of local communities from farming and fishing, (5) percentage of local employees to total labour force, (6) percentage of local procurement to total procurement in number and monetary value, (7) number and volume of significant spills stating (i) location of spill, (ii) volume of spill, (iii) material of spill, categorised by (a) oil spills, (b) fuel spills, (c) spills of waste, (d) spills of chemicals, (e) others (to be specified by the organisation), (8) the impact of spills on water, land and air, (9) displacement of fish in water and animals on land as a result of spills and (10) total number of incidents of diseases as a result of spills and gas flaring.

It is such priority disclosures that hold the key to accountability relating to responsible consumption and production by extractive MNCs in West Africa as advocated by SDG 12. Such disclosures will show that these MNCs, through the social and environmental impact of their operations, undermine SDG 1 (no poverty), SDG 2 (zero hunger) and SDG 3 (good health and well-being) for local communities.

17.7 Conclusion

This chapter critically engaged with existing accountability mechanisms in the form of financial and sustainability reporting to highlight their limitations in relation to SDG 12—responsible consumption and production especially in the extractive industry of West Africa, using Nigeria and Ghana as reference points. It also argues that the current set of UNCTAD indicators is inadequate in the face of the substantial social and environmental impact of the extractive industry. Based on the above, the authors recommend that the UNCTAD ISAR's indicators should be modified to prioritise those indicators that focus on the right to life of the local communities, and their access to land, water and air which constitute their means of livelihood. They should also reveal the spills that pollute the land, water and air that cause ill health in local communities.

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18 Using the Past to Inform a Sustainable Future: Palaeoecological Insights from East Africa

Esther Githumbi, Rob Marchant and Daniel Olago

Abstract

An important aspect of the UN Framework Convention on Climate Change (UNFCCC), which aims to limit the increase in global temperature to 1.5 °C by 2050, has been the development of monitoring and evaluation plans that integrate climate change perspectives into new policies and programs for the protection and functioning of ecological systems. These include measures that enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change. Ecosystem change and the interaction of the different drivers of change in ecosystems have been studied at different temporal and spatial scales across different disciplines. However, the use of long temporal records documenting environmental and climatic change in understanding the impacts of the interacting drivers of change and planning sustainable use of resources is relatively new. We present examples of the use of palaeoecological data from East Africa in planning for the long-term sustainable use of natural resources by providing long-term historical perspectives on human–environment–societal–wildlife interactions and engagement with the biocultural heritage and societal evaluations of these spaces to achieve an increasingly diverse set of conservation, social and economic objectives. We link the Earth system processes whose associated boundaries can be directly related to sustainable development goals in our attempt to prevent unacceptable environmental change. The realisation that humans are having a significant impact on climate and landscapes means we now need to showcase the societal relevance of palaeoecological research and utilise its output especially in our efforts to remain within a safe operating space for humanity and ecosystems.

Keywords

Environmental history · Pollen · Remote sensing · Savannah · Swamps

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18.1 Introduction

Climate change and human activities have impacted on ecosystems, with two-thirds of the earth's ecosystem considered degraded causing loss of ecosystem extent, loss biodiversity and associated essential ecosystem goods and

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services reduced stability in community networks (Kan and Djoghlaf 2010; Thompson et al. 2017). The attribution of impacts on specific drivers is very contentious due to the complexity of natural systems and the interacting drivers. However, the study of different proxies over longer timescales provides scope for interpretation of cause and effect (Oldfield and Alverson 2003). Paleoecology is the study of past ecosystems using a variety of proxies to examine the relationship between organisms and their environment. Palaeoecological studies are the only approach that can contribute a long-term perspective on climate–human–ecosystem interactions. This is because they provide an understanding of processes that take long periods of time such as ecological succession, migration, community assembly, etc. (Rull 2014).

Environmental change has occurred naturally with the earth's regulatory capacity maintaining conditions suitable for human development. These suitable conditions are maintained within narrow operating safe spaces (Rockström et al. 2009) known as planetary boundaries. Rockström et al. (2009) identified nine earth system processes with critical threshold values and defined their planetary values while Dearing et al. (2014) defined social well-being spaces within which policy impacts can be increased due to the understanding of environmental and social systems. Deep time perspectives as well as social perspectives are key for addressing priority biogeographical and conservation questions and underpin the concepts of sustainability and what is a safe operating space (Fig. 18.1). These insights include, but are not limited to, identifying

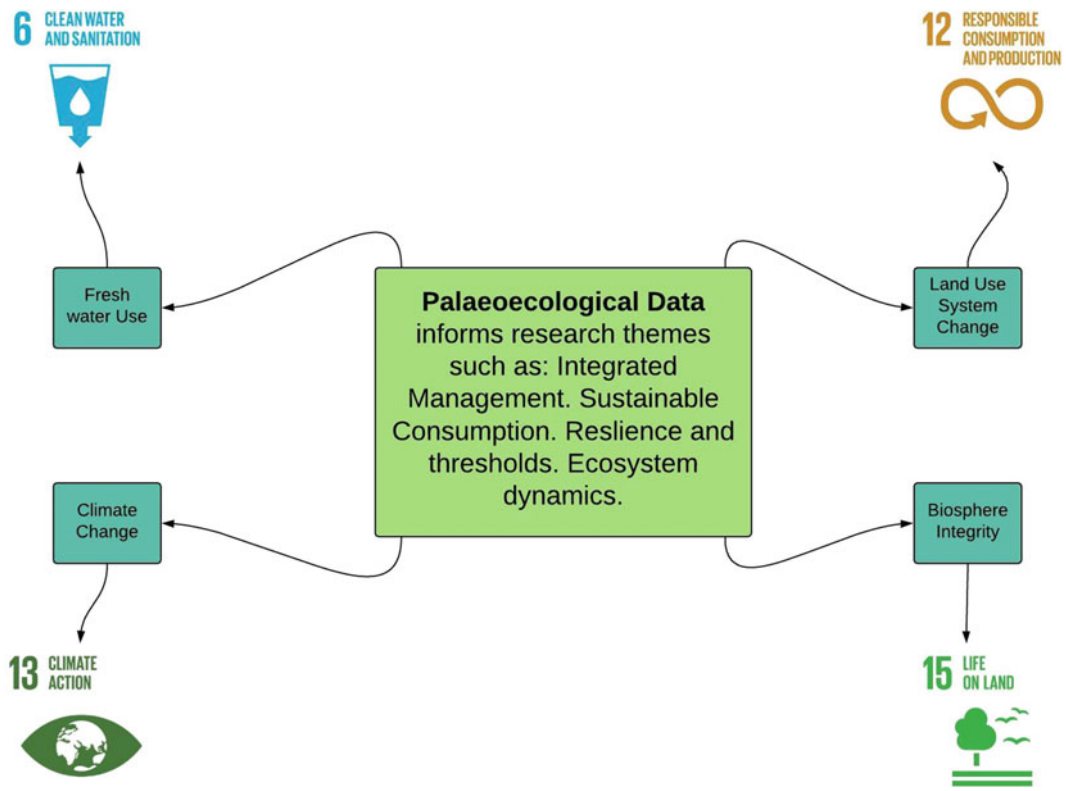

Fig. 18.1 Relationship between critical earth system processes (green squares), SDGs and examples of research themes where palaeoecological is useful (SDG images from https://www.un.org/sustainabledevelopment/sustainable-development-goals/)

locations that remain buffered under the present climate change trends, and how linking past and future ecosystem response to such changes can help mitigate biodiversity loss (Pfeifer et al. 2012). Indeed, largely as a result of analysing long-term palaeorecords, the impacts of global environmental change are now being understood and the realisation that we are now living in the Anthropocene where change is driven primarily by human activity (Ellis et al. 2013).

We have identified four earth system processes whose planetary boundaries have been identified (Rockström et al. 2009), four Sustainable Development Goals (SDGs), i.e. 6, 12, 13 and 15 and four examples of research themes that can be informed by palaeoecological data (Fig. 18.1). Data that can provide accurate reconstructions of long-term change is crucial for the validation of scenarios of future change. SDGs 6, 12, 13 and 15 are underpinned by ecosystems and the goods and services they provide. Goal 6 focuses on clean water and sanitation. Goal 12 focuses on sustainable consumption and production patterns through promoting resource and energy efficiency, and sustainable infrastructure. Goal 13 highlights the action that is needed to combat climate change and its impacts. Goal 15 focuses on securing life on land and aims to sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss (United Nations 2015).

Indeed, more widely the SDGs emphasise the enormous value that people place on the goods and services that they obtain from ecosystems, and the crucial role these goods and services can play in poverty alleviation and development (Cuni-Sanchez et al. 2016). In East African nations, ecosystems are *the* primary resource for human well-being and provide key functions essential to sustainable economic development. Most economies from the Global South are heavily dependent on agriculture, rangeland pastoralism, forestry management and wildlife tourism: for example, Tanzania had set aside ~31% of its land mass by 2003 in National Parks, Game Reserves and Forest Reserves (Brockington et al. 2008). Protected areas by landmass increased to ~38% as reported in 2014 (Lin et al. 2014).

Understanding past ecosystem processes enhances our capability of predicting future change and long-term studies of the past are essential as ecosystem variability exceeds what is captured by short periods of instrumentation and recent historical studies (Oldfield and Alverson 2003). We demonstrate that the significant understanding gained from the available long-term records as well as the continual study of long-term change can, and should, inform strategies implemented to ensure the attainment of the SDGs (Fig. 18.1). This chapter discusses how palaeoecological data can be used to inform SDGs. We identify four SDGs that can benefit directly from the knowledge gained and provide specific examples of the studies in which the information gained can already be used.

18.2 Goal 6: Clean Water and Sanitation

SDG 6 aims to ensure availability and sustainable management of water and sanitation for all. Palaeoecological proxies in accumulated lake sediments, such as diatoms (Cohen et al. 2007), chironomids, geochemistry (Burnett et al. 2011) and geomorphological evidence such as fossil strandlines and stromatolites (McKee et al. 2005), are indicators of changes in water level/volume. These, amongst other proxies, have provided information about long-term changes in water levels in most of the major African lakes as well as small wetlands. Large and sometimes abrupt fluctuations in the water balance have been experienced throughout the Holocene period (Odada and Olago 2005; Olaka et al. 2010). These are closely linked to long-term natural climate changes occurring over geological timescales (Gasse and Van Campo 1994; Trauth et al. 2003), and in the longer term to geological processes such as rifting, volcanism and tectonics (Olago et al. 2009; Olang et al. 2010; WoldeGabriel et al. 2016) that modify the regional climatic and hydrological expressions on and beneath the earth surface.

During the Holocene period (the last 10,000 years), abrupt hydrological changes have been observed, under boundary conditions that are similar to today (Oldfield and Alverson 2003). Furthermore, over the last 1,000 years, significant hydrological extremes (desiccation and high lake levels, respectively, lasting for a few decades or one to two centuries) have been recorded in lakes such as Baringo (De Cort et al. 2018), and Naivasha (Verschuren et al. 2000). Recent significant lake level increases in the rift lakes of Kenya (2011–2013) have destroyed infrastructure, property and livelihoods when previously dry shoreline areas were inundated (Onywere et al. 2013). Groundwater is similarly affected by the hydrological variability. Large swathes of East Africa are arid and semi-arid landscapes, and many communities are solely dependent on the groundwater resource for the potable water supplies, and for general water uses. There have been reported changes in groundwater resources, linked in part to modification of groundwater recharge areas, and higher variability in rainfall, its duration and intensity, among other factors. However, little is still known about the groundwater–surface water linkages in the region (Olago et al. 2009) and more evidence-based research is required to determine the interrelationships and what they mean for the sustainable management of groundwater resources in the context of a changing climate.

Water quality issues are also driven by both natural (long-term) and anthropogenic (short to long-term) factors. For example, fluoride levels in many of the East African rift lakes and groundwater systems exceed WHO guidelines for potable water (Nair et al. 1984). Pollution modelling studies have also shown that lakes such as Victoria, which are also used for potable water supplies, are extremely vulnerable to pollution, being able to reduce pollutant loads by only 10% one hundred years after exposure because of the long flushing time and residency of the pollutants (Lindenschmidt et al. 1998; Odada et al. 2004; Muwanga and Barifaijo 2006). Studies of the past can, therefore, be utilised to support present-day decision-making in the management of the various water resources. Palaeoecological studies of, for example, small wetlands in Amboseli, Kenya (Gillson 2004; Rucina et al. 2010; Githumbi 2017) have been used to inform their utilisation by the local and central government when planning and implementing water and sanitation management strategies. Such local sources of water are sometimes neglected in the local and national water planning and budgets.

18.3 Goal 12: Sustainable Consumption and Production Patterns

A major global challenge is to ensure sustainable production and consumption while maintaining ecosystem functions and services as well as biophysical services. This is exacerbated by the fact that traditional strategies of meeting social needs and protecting ecosystem services and functions can be sometimes antagonistic. Attempts to propose ecological boundaries (Rockström et al. 2009; Dearing et al. 2014) that global society should remain within, if it is to avoid 'disastrous consequences for humanity' are encouraging the integration of different perspectives in the decision-making process for sustainable natural resource management. Availability of long-term records is crucial in ensuring that ecological boundaries can be identified. Thresholds can be analysed in long temporal records covering wide spatial regions, as the effects of the different drivers of change are transboundary and can have lag effects (Gillson and Marchant 2014). This long-term specific data can be used to decide the acceptable level of change as well as determine threshold levels that ought to be considered during policy development and to guide political decisions, which often tend to be short term.

Applying a number of proxies to the East African, sediment records have provided data on the development of ecosystems as well as the impacts due to specific consumption patterns (Marchant et al. 2018). Records from small wetlands within East Africa such as within the Amboseli landscape have revealed the loss of wetlands due to the over-abstraction of water

mainly for irrigation (Githumbi et al. 2018) as well as changes in the vegetation composition that signal a change in the ecosystem (Gillson and Duffin 2007). Consumption and production patterns influence changes in ecosystems such as the switch between savannah grasslands and woodlands; changes in ecosystems are further determined by the level of herbivory, fire, human management as well as climatic factors (Gillson and Duffin 2007; Gillson and Ekblom 2009; Rucina et al. 2010; Heckmann 2011; Biginagwa 2012; Githumbi et al. 2018). Commercial logging changes forest composition while clearing of forests for farming and settlement leads to more open landscapes (Mumbi et al. 2008; Rucina et al. 2009; McGlynn et al. 2013; Pellikka et al. 2013). The findings from analyses of long-term records on ecosystem history can be utilised in the monitoring and management of ecosystems at a large scale, such as forests managed by governments and protected areas managed as private property and/or public property, through their incorporation into management plans.

18.4 Goal 13: Take Urgent Action to Combat Climate Change and Its Impacts

It is widely recognised that there may be large local and regional departures from the global means of climate change (Griggs and Noguer 2002; Boko et al. 2007). Within East Africa, there are a number of changes in climate and environmental factors that are pointers as to the reason why actions should be taken to mitigate the impacts of climate change and to build the resilience of human and ecological systems that are impacted by it. A meta-analysis of palaeoecological records covering the last 20,000 years indicates that tropical Africa forests generally recovered faster from natural disturbances than those in South America and Asia, as do forests exposed to natural large infrequent disturbances. (Cole et al. 2014). The Eastern Arc montane forests are an example of environmental stability through different climatic periods over the last 38,000 years (Mumbi et al. 2008).

There are many reported changes associated with rainfall in the region, including changing dates for the onset and cessation of seasons, increased magnitude/frequency of short-duration storms, and higher magnitude, frequency and duration of flood and drought episodes. Changes in temperatures (T_{max} and T_{min}) have also been observed (King'uyu et al. 2000). Although for T_{max}, the signal is ubiquitous across the region, T_{min} changes are ambiguous, with increases observed in some areas and decreases in others (King'uyu et al. 2000; Olago et al. 2007). These climate changes have impacts on people, their well-being and livelihoods, as well as the ecological systems upon which many of them depend on for their livelihoods. Further, the ecological structure and functions of the lakes changed, leading to changes in the fishery resources, and impacts on local and international tourism, such as through the submergence of the well known and visited geysers of Lake Baringo. River flows have become more variable as a consequence of the enhanced variability of rainfall, with major impacts on the economy through, for example, reduced supply of energy from hydroelectric power stations (Siderius et al. 2018) and electricity rationing. Models predict increased warming in high altitude areas (Loomis et al. 2017) which will threaten high altitude ecosystems goods and services such as functioning as a water tower which is critical for lowland inhabitants.

18.5 Goal 15: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss

Research that assimilates the linkages between societal and ecological processes through time and across space is utilised to increase our understanding of the impacts such as habitat fragmentation, biodiversity loss and loss of ecosystems

amongst others (Marchant et al. 2010; Marchant and Lane 2014). Sustainable use and development of different ecosystems (aquatic, dryland, forests, etc.) involve assessing the trade-offs between several development strategies in order to identify the impacts of each strategy (Davies et al. 2015).

Precolonial agronomies in East Africa can be used as examples of sustainable resource use due to their ability to maintain large rural populations at low water, soil and labour costs although due to the fragmentary nature of the available data, such conclusions require more data sources (Stump 2010). Food and water demand are expected to increase by 70–80% and 30–85%, respectively, over the next 50 years (Corvalan et al. 2005); this means that sustainable use of ecosystems is essential to reduce habitat and biodiversity loss accompanying the production strategies needed to meet these requirements. Vegetation composition change from a predominantly Afromontane forest to a more open forest such as the Eastern Arc mountain pre-LGM (Mumbi et al. 2008) or a pre- dominantly Afromontane forest to dryer forest composition as observed at Mau Forest Complex (Githumbi 2017) is partly attributed to long-term natural climate changes that have remained constrained within well-defined boundaries, at least for the past 800,000 years. Other factors contributing to the changes are forest clearance for agriculture or settlement as observed from Ugandan and Mt. Kenya records (Taylor 1990; Finch et al. 2009; Rucina et al. 2009; Marchant et al. 2018). Adaptive management with emphasis on feedback learning and its treatment of uncertainty and unpredictability intrinsic to all ecosystems is essential for sustainable management of forests.

Land degradation has been observed from several East African palaeoecological records, for example, high rates of soil erosion and land degradation are observed from completely different ecosystems, e.g. Lake Baringo (Kenya) and North Pare (Tanzania), at least for the past 350 years (Kiage and Liu 2009; Heckmann 2011, 2014). Highland degradation can lead to: decreased biodiversity, reduced capability of vegetation to capture atmospheric moisture and retain water in the vegetation cover, exposure of land to water and wind erosion, and changes in the radiation balance of the land surface as land is exposed and barren part of the year (Pellikka et al. 2013). Insights gained from these studies have identified the possible causes of land degradation, for example, the transformation of natural landscapes whether forested or not increases the risk of soil degradation. Over-abstraction of water from small wetlands leads to a reduction in water level or complete drying up of wetlands for example as observed in Tanzania using satellite data (Seki et al. 2018). This knowledge can be applied in the planning of current and future resource management strategies.

18.6 Conclusion

Focusing on the varied landscapes of East Africa, the environmental history derived from a suite of radiocarbon-dated sediment cores from numerous swamps and lakes across the region have been presented, and their utility in guiding us to achieve the SDGs has been discussed. Palaeoecological studies have provided long-term climate reconstructions spanning hundreds of thousands of years, with the use of multiple indicators to provide evidence of the interactions between climate and human interactions. These studies have significantly improved our understanding of change through time and interacting factors within landscapes. Changes in vegetation taxa and charcoal counts are associated with climatic changes, fire activity, anthropogenic interaction and developing land use change. The arrival of new technologies and cereal crops occurs consistently to provide a time-bound marker of increased anthropogenic activity. Sedentary agriculture has intensified dramatically through the colonial period; a transition accelerated during postcolonial administration under the most recent expansion. Intensive land use which is increasingly focused around protected area boundaries, severely challenges the adaptive capacity of plants, wildlife and the provision of ecosystem services that underpin the livelihoods of rural communities. Interpretation and presentation of palaeoecological data in a form suitable for

ecosystem managers and policy developers will ensure strategic development of sustainable resource management.

We need to use past societal and ecological trends to examine the use of ecosystem services through time and under different landscape management regime, to better predict how human–environment–societal–wildlife relationships may respond to future climate change, management interventions and societal use in the future. Such long-term perspectives are crucial for current and future climate change and associated livelihood impacts, so that suitable responses to ensure sustainable management practices can be developed. We have identified ways in which palaeoecological data can be utilised in answering present and future problems. Further studies incorporating long-term environmental histories and management decisions in order to continue operating within safe planetary and social spaces while achieving the SDGs are crucial. This can lead to the development of datasets and knowledge that are useful to land managers with future planning and policy as a basis.

Collaboration between governments, non-governmental groups, civil societies and private businesses is necessary at a global level to achieve the SGDs. Frameworks to foster this joint effort such as associations providing a platform for collating thematic insights that are utilised in the implementation of the SDGs are crucial. An example would be the Sustainable Development Goals Center for Africa whose purpose is to 'provide technical support, neutral advice and expertise as input to national governments, private sector, civil society, academic institutions to accelerate the implementation of the SDG agenda across Africa' (Sustainable Development Goals Center for Africa 2015).

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19 Biodiversity, Wildlife and the Land Question in Africa

Maano Ramutsindela and Paballo Abel Chauke

Abstract

The concerns of environmental scientists, environmental non-governmental organisations, government agencies and international bodies with biodiversity are aptly captured with observations in the United Nations Secretary-General's *Report on Progress towards Sustainable Development Goals* released on 11 May 2017. The Report notes the increase in biodiversity loss, declining land productivity and the increase in the poaching of wildlife, among other challenges. While these problems are real, there is a need to comprehend how their solutions intersect with other national policies or development agendas in Africa. Literature shows that trading off Sustainable Development Goals (SDGs) or the failure to draw synergy among them undermines their universal aim of ending poverty, protecting the planet and ensuring prosperity for all. This chapter adds to this literature by showing that some of the efforts toward curbing biodiversity loss ironically create conditions that work against the protection of biodiversity while also deepening existing socio-economic problems. The chapter demonstrates this irony by referring to SDG 15 and its relations to inequitable land distribution in African contexts. It argues that efforts to reduce biodiversity loss by expanding protected areas and by excising land in the battle to curb rampant poaching compound the very challenges as they lead to a situation, where land alienation and poaching are entangled in a vicious and unabating cycle.

Keywords

Biodiversity · Land policy · Wildlife · Poaching · Africa

19.1 Introduction

The world we inhabit is currently embroiled in a myriad of social, economic, political and environmental challenges including extreme poverty, poaching, enormous economic disparities, climate change and others (Lamarque et al. 2009; Brown 2014; Rodriguez-Pose and Hardy 2015; Bierman et al. 2016). In a concerted effort to address these and other crises, world leaders, philanthropists, celebrities and members of various epistemic communities have mobilised and negotiated a slew of solutions often resulting in international treaties or agreements such as the Paris Agreement or Bonn Convention (Roberts et al. 2015; Routledge et al. 2018). Many of these efforts are led by the United Nations, through its

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wing, the United Nations Development Programme (UNDP). The UNDP has over the years adopted various global policies and treaties as a pathway to sustainable development. Though the SDGs were launched in 2015, they are nested inside the broader concept of sustainable development (SD), described by the Brundtland Commission in 1987 as 'development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs' (World Commission 1987, p. 16). In view of the abundance of literature on sustainable development, this chapter highlights that the concept has since its inception divided thinkers into two main schools of thought. One school argues that the ideals of SD are necessary despite the ambiguities and shortfalls of the concept and its underlying ideology (Osorio et al. 2005). The other school constitutes analysts who are critical of the concept, which they see variously as an oxymoron, ambiguous, nebulous and as entrenching inequalities globally (Gallopin 2003; Marcuse 1998; Spaiser et al. 2017). We recount these schools of thought here because they are relevant to debates and perspectives on SDGs.

This chapter adds to critical scholarship on sustainable development through the lens of SDG 15. It argues that efforts to reduce biodiversity loss by expanding protected areas, and by excising land in the battle to stop rampant poaching, compound the problem of conflict between people and protected areas, and also creates a vicious cycle of poaching and land alienation. The chapter is divided into three main parts. The first part discusses renewed concerns with biodiversity loss and how this loss is framed in the SDGs. This discussion is followed by the second part, which focuses on the imperatives of land reform in Africa. The last part draws the link between land alienation and the strategies and tactics used in the fight against wildlife poaching, especially in southern Africa. To be sure, poaching is considered one of the major threats to biodiversity. According to Bell et al. (2007, p. 400) '[t]he predominant view of poaching in the ecological literature is that it is unequivocally detrimental in terms of its impacts on biodiversity'. Some of the anti-poaching strategies involve land alienation and the criminalisation of locals (Moreto 2015; Masse and Lunstrum 2016; Hübschle 2017). We argue that this situation leads to more violence that threatens biodiversity, peace, and the livelihood of the local population.

19.2 Concerns with Biodiversity Loss

In the *Conservation Manifesto*, Sanders (2009, p. 211) describes the work of conservationists as one driven by 'wonder, gratitude, reason, and love' but as also 'inspired by a sense of loss'. Here, the sense of loss refers to serious environmental problems such as species extinction, land degradation, and so on, which have been focal areas in biodiversity conservation plans. SDG 15 builds on the Millennium Development Goals (MDGs) and should be understood as the most recent plan that re-articulates and supports earlier conservation targets and plans. It suffices to say that the adoption of the SDGs in 2015 was preceded by the creation of a new global network of sustainable development problem-solving known as the Sustainable Development Solutions Network (SDSN) that was launched in 2012. The SDSN recommended ten goals, one of which was SDG 9, which aimed to secure ecosystem services and biodiversity, and to ensure good management of water and other natural resources. The SDSN recommended that 'biodiversity and marine and terrestrial ecosystems of local, regional and global significance should be measured, managed and monitored to ensure the continuation of resilient and adaptive life support systems that support sustainable development' (Sachs 2015, p. 489). This recommendation laid the basis for the current SDG 15 and its title, 'Life on Land'. As with other SDGs, 'Life on Land' is ambitious—it seeks to 'sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss' (United Nations Online 2016).

Over the years, international efforts to halt biodiversity loss have resulted in setting

biodiversity targets. For example, the International Union for Conservation of Nature (IUCN) recommended that each country should set aside 10% of its land for protected areas. The Congress of the Parties to the Convention on Biological Diversity sets 20 Aichi Biodiversity Targets, with Aichi Target 11 aiming to bring 17% of terrestrial and inland water and 10% of coastal and marine areas under protected status (Woodley et al. 2012). Scientists are worried that these targets are low compared to the high rate of species extinction. The scientific validity of these targets has also been questioned; leading to the most recent call to put half the earth under protected status (Locke 2014; Wilson 2016). Others have responded to this call by suggesting that ecoregions could be used to increase and diversify protected areas around the world (Dinerstein et al. 2017).

It should be emphasised that the need to halt biodiversity loss and to set biodiversity targets was central to the formulation of SDG 15. Powerful environmental non-governmental organisations (ENGOs) such as the World Wide Fund for Nature (WWF) participated in the formulation of SDGs 'to make certain that the plan puts the planet on the path toward truly sustainable development and that it includes the environmental elements that give it the best chance for success' (WWF Online, 2015). The IUCN made it clear that SDGs should build on existing biodiversity targets, strategies, and the Convention on Biodiversity Conservation (IUCN 2013). In a show of unity of purpose, WWF, Conservation International, the Nature Conservancy and IUCN issued a joint statement 2 months before the adoption of the SDGs by the United Nations, calling for precision in the setting of targets for SDG 15, and the alignment of this SDG with the Aichi targets referred to above (IUCN 2015). Such an alignment has been realised through SDG 15 target 15.9, which aims to 'integrate ecosystem and biodiversity values into national and local planning, development process, poverty reduction strategies and accounts' by 2020 (United Nations Online 2015). The indicator for this target is the 'progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011–2020' (United Nations Online 2015). Aichi Biodiversity Target 2 requires countries to translate Aichi targets into specific and precise national targets. A closer reading of indicators for the first four targets of SDG 15 reveals that the proportion of land under protected areas is crucial to the achievement of this goal. The four ENGOs mentioned above wanted the actual number of hectares rather than the proportion of the land to be specified in SDG 15. For example, they wanted the text for SDG 15 to specify that 350 million hectares should be set aside for reforestation (IUCN 2015).

Though biodiversity targets are highly debatable among scholars as well as practitioners, they nevertheless impose a particular framing of the interaction between people and land. That framing is clear from models and analyses of humanity's effects on the ecosystems. For example, a central question in Vitousek et al.'s (1997) model of these effects is how much land humanity has transformed, and with what consequences for the earth's ecosystems. They conclude that 'land transformation is the single most important cause of extinction, and current rates of land transformation eventually will drive many more species to extinction' (Vitousek et al. 1997, p. 498). This concern with land transformation represents the general view of the causes of environmental problems. While we do not dismiss these causes, we are concerned that this singular view on the effects of land transformation on biodiversity does not pay adequate attention to another type of land transformation, namely, land alienation. Below we show that land alienation was a common feature of colonial Africa, and that land reform measures to reverse this colonial legacy have in the main produced unsatisfactory results. Pursuing biodiversity targets referred to above complicates the main goal of land reform, namely to reconstitute and to redistribute land rights to previously oppressed peoples, whose land was alienated from them through a myriad of processes that unfolded in the colony as well as in the postcolony.

19.3 The Need for Land Reform in Africa

In this section of the chapter, we recount the need for land reform in Africa with one objective in mind: to show that SDG 15 neglects the pending historical land question on the continent. Instead, it pays little or no attention to the need for land reform as necessary for or integral to the goals of sustainable development. In doing so, it confirms what scholars have described as the prioritisation of biodiversity protection above land reform (Kepe 2018; Ramutsindela and Shabangu 2018). Our premise is that pursuing the SDG 15 targets without paying attention to the need for land reform will leave the colonial legacy of land dispossession in Africa intact. The provocation we present here is that the urgency for acquiring land for biodiversity protection and the broader project of greening the planet have the potential to lead to new forms of dispossession that mirror neo-colonial projects elsewhere in the world (Ramutsindela 2004; Kelly and Gupta 2016; Ramutsindela and Shabangu 2018). Scholars have documented how the land, fisheries, forests, etc., have been alienated in Africa and elsewhere through green grabbing, i.e. new ways of appropriating land and other natural resources for environmental purposes through various channels and means (Fairhead et al. 2012; Apostolopoulo and Adams 2015; Scoones et al. 2015).

The neglect of land reform is a major risk for SDG 15 targets, and has the potential to deepen existing socio-economic problems that most other SDGs are trying to solve. Land reform in Africa is necessary for a number of reasons, which have been discussed elsewhere (Moyo and Yeros 2013). The most relevant reasons for the discussion in this chapter relate to the colonial violence of land dispossession, the need for redress, and the developmental implications of land reform. Land and resource alienation, and the control of local populations were common features of the colonial enterprise. Land reform in Africa should, therefore, be understood as a response to this colonial legacy by post-independence governments and civil society organisations. Such responses could not have been similar across the continent, mainly because colonialism was a highly differentiated process. For example, British colonialism produced four main categories of land tenure, namely state land, freehold land, land under leasehold and communal land.

The amount of land under each of these categories at independence differed remarkably from one country to another (West 2000). Due to these differences but also because of the nature of the political transition from colonial rule to independence, different land reform processes were followed. In countries such as South Africa and Zimbabwe, post-independence land reform policies were tied to a negotiated political settlement. Moyo and Yeros (2013, p. 332) have argued that in the 1980s, Zimbabwe was 'actively promoted as a model of political transition in the settler societies of Southern Africa, whereby majority rule was to be conditioned on property guarantees'. Indeed, South Africa followed such a model with the result that the property rights clause was also one of the thorniest issues in negotiations for the country's new constitution that was adopted in 1996. Chapter 2, Section 25 of the constitution guarantees everyone's right to property, which means that the constitution protects property acquired under, or with the assistance of colonialism and apartheid. Property guarantees lock land away from post-independence governments, and therefore impose severe limitations on the territorial rights of the state but also on resource sovereignty. We do not dwell on these rights here to avoid going astray but we refer to them to highlight the entanglement of property rights and resource ownership and the implications they have for the realisation of SDG 15 targets. A significant proportion of land in some African states is in private hands, and this situation makes it hard for such states to place more land under protected areas.

Property guarantees entrenched skewed land distribution in favour of white landowners, especially in Zimbabwe and South Africa. In colonial Zimbabwe, white large commercial farmers owned some 50% of arable and ranching land though they comprised a minority

(Gaidzanwa 2016). In South Africa the white minority owned over 80% of the land at the time of the country's liberation in 1994. It should be noted that this disparity in land ownership is generally more pronounced in countries with a relatively high white settler population, and where there is a freehold land system. The most important explanation for this disparity, though, is the process by which land was acquired by the settler population or local elites. One of the dominant features of this process is forced removals of local African populations. In settler societies on the African continent, such removals were motivated by the colonial desire for a geographical separation of racial groups. Other forms of resettlement such as in post-independence Tanzania were motivated by a socialist-inspired villagisation programme (Ujamaa) in the 1970s, which sought to create cooperatives for small-scale farmers.

Various types and methods of population removal were also instrumental in the establishment of protected areas in many African countries. Examples of these removals include the Kwai from Moremi Game Reserve (Botswana), the communities of Madonsi, Makahane, Makuleke, Muyexe and Nkuna from the Kruger National Park (South Africa), the Khomani San from Kalahari Gemsbok National Park (South Africa) and some 3000 households from Limpopo National Park (Mozambique). In East Africa, the Maasai were embroiled in conflict with colonial governors who created one of the world's flagship protected areas, Serengeti National Park (Kidighesho et al. 2005; Kideghesho and Mtoni 2008). Chongwa (2012) as well Matheka (2008) trace the creation of protected areas in Kenya to British colonial rule in 1800s, whereby local communities were removed to reserve the lands for European hunters. African people are still being removed from areas designated for protected areas in the twenty-first century. These removals lead to what Dowie (2011) dubbed conservation refugees, and constitute one of the dark sides of nature conservation in Africa and elsewhere. They are also an important factor in ongoing conflicts between protected areas and local residents, where problems of access to land and other natural resources have not been resolved. The question that arises from these conflicts is whether the SDG 15 has the potential to create conditions under which they could be resolved so as to ensure both sustainability and poverty reduction.

Human beings living in close proximity to wild and protected areas continually experience conflict with a myriad of wild animals (Woodroffe et al. 2005; Sillero-Zubiri et al. 2007; Barua et al. 2013). Such human–wildlife clashes have resulted in grave injury, loss of property and livelihood or death (Inskip and Zimmermann 2009; Liu et al. 2011; Marchini and Macdonald 2012). Conservation in the twenty-first century, unlike before, has the challenge to reconcile and also find the right balance between the protection of nature and the needs of ordinary people, especially in Africa. Such balance rests on the use of sustainability as a basic tenet (Adams and Sandbrook 2013; Sandbrook 2015). If indeed conservation is about 'actions that are intended to establish, improve or maintain good relations with nature' (Sandbrook 2015, p. 565), how could such good relations be achieved when the problem of land alienation has not been resolved? As we will show below, this problem is further compounded by anti-poaching strategies that are anchored on land dispossession.

19.4 Wildlife Poaching and the Cycle of Violence

Wildlife poaching and trafficking continues to thwart conservation efforts. Illicit wildlife markets are complex and subject to rapid fluctuations. Demand for a given wildlife product can grow quickly, before the international community can react. In 2013, elephant ivory, rosewood and rhinoceros horn comprised over 60% of total wildlife and timber product seizures (United Nations Online 2017).

The problem of wildlife poaching is not new but is currently receiving much greater attention for at least two main reasons. First, it is considered one of the main contributing factors to the extinction of species (MacKenzie 1988), but also

as a crime against nature (Jacoby 2003). It is for this reason that it is included in the UN Secretary-General's Report on progress of Goal 15 in 2017. Second, wildlife poaching and the accompanying illicit trade are viewed mainly by powerful countries as a source of funding for criminal syndicates and terrorist organisations (National Geographic 2015). The United States not only sees wildlife trafficking as 'the poaching of protected species and the illegal trade in wildlife and their derivative parts and products' (United States 2013, p. 1) but also considers it a security issue in its war against terror. Duffy et al. (2016) argue that the understanding of poaching is generally thwarted by lack of data since poachers are not easy to interview, and are unlikely to identify themselves for fear of punitive action. It is not our intention here to enter into the heated debate on the link between poaching and terrorism. Rather we seek to highlight different viewpoints on wildlife poaching and, more importantly, to contextualise wildlife poaching as a biodiversity problem with wide-ranging implications. The chapter focuses on two of those implications, namely land loss and the cycle of violence triggered by anti-poaching strategies that are less sensitive to the needs, dignity and livelihoods of local residents.

The main point in this section is that alienating land from ordinary people in order to create buffer zones against poaching, but also to push local people further away from protected areas is a violent act that strains the relationship between people and parks. Local people deprived of their land and other livelihood possibilities poach wildlife in retaliation and as a form of resistance (Hübschle 2017). Such a vicious cycle of violence compounds the very problem SDG 15 is meant to solve. Before we give evidence for this point, we acknowledge that the extinction of wildlife is of great concern and that it requires urgent interventions. Society should, however, be equally concerned about anti-poaching strategies that impact negatively on the lives of ordinary people. The case of anti-poaching strategies in the Great Limpopo Transfrontier Park (GLTP) on the Mozambique–South Africa–Zimbabwe borderlands shed light on some of these impacts. The creation of the GLTP as a cross-border conservation project is well documented (Ramutsindela 2007). For the purpose of the discussion in this chapter, we highlight that the creation of the GLTP involved the removal of people on the Mozambican side, and that this cross-border park is also an epicentre of the rhino poaching crisis in southern Africa.

In brief, the creation of the Greater Lebombo Conservancy (GLC) in Mozambique—along South Africa's Kruger National Park (KNP)—in 2012 was a response to the increasing scourge of rhino poaching in the KNP. The GLC is a joint effort of the governments of South Africa and Mozambique, the private landowners and ENGOs to strengthen the security of the GLTP on the Mozambican side (Masse and Lunstrum 2016). It is specifically a collection of private land concessions which act as a buffer and security zone designed to prevent potential rhino poachers, who supposedly originate in Mozambique, to cross into the KNP. Of relevance to the discussion in this chapter is that the GLC is an anti-poaching buffer zone that was created through a series of land dispossessions. Conservationists argue that it is difficult to police the area with people living inside the perimeters. Hence, the two-edged violent processes of removing people while also taking away their land. Masse and Lunstrum (2016, p. 233) commented on the violence as follows: 'what remains in the villages, including houses, will be burned down to prevent people from retuning and to encourage those who want to remain to leave'. Thus, local people were dispossessed of their land and resettled on the basis of saving biodiversity (curbing biodiversity loss), in particular the loss of rhinos. This kind of dispossession is part of a broader narrative in which 'rural residents in particular are routinely portrayed as environmentally irresponsible peasants, a common practice used to legitimise their dispossession and the enclosure of common land and resources' (Masse and Lunstrum 2016, p. 233).

Anti-poaching methods in this and other instances result in local people plunging deeper into poverty, landlessness, and in some cases death. It has been reported that between 2008 and

2013 over 300 suspected poachers were killed in the KNP alone (Duffy 2014). The consequences of the dispossessions meted out on local people in order to fight poaching ironically leads to more poaching and other intricately linked ramifications. The reasons are contextually and historically dependent (Duffy 2014), and the justifications for poaching are almost invariably not mutually exclusive due to the fact an individual poacher may have multiple, layered, nuanced and complex motivations staggered or pursued simultaneously (Bell et al. 2007). They are diverse and range from subsistence hunting to rebellion or resistance, among other interlinked rationales.

19.5 Conclusion

This chapter brought together the land question in African contexts and the strategies to combat biodiversity loss to demonstrate that efforts to expand protected areas and to reduce biodiversity loss by alienating land from local people run the risk of creating a cycle of violence and poverty. This cycle does not augur well for SDGs. Neumann (2004) reminds us that most African protected areas are spaces where human rights violations are evident, and where violence against local poor people in order to protect wildlife has been rendered mundane. Local people have agency, and have sometimes used poaching as a form of speaking truth to power, and as a form of resistance (Neumann 2004; Hübschle 2017). We concede that the current poaching needs to be addressed head-on but argue for attention to poaching and its dynamics of discrimination, dispossession and violence in the African context. We must interrogate how the implementation of SDG 15 reconfigures these dynamics for sustainable development in Africa.

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Water and Sanitation Inequality in Africa: Challenges for SDG 6

20

Horman Chitonge, Amanda Mokoena and Minga Kongo

Abstract

Sustainable Development Goal (SDG) 6, which focuses on sustainable access to clean water and sanitation, pledges to ensure the 'availability and sustainable management of water and sanitation for all' people. Achieving this goal goes beyond the task of making water and sanitation services available to all communities; it entails measures that ensure that there is sustainable use and management of water resources. In this chapter, we examine water and sanitation services in Africa, highlighting the challenges of achieving the two dimensions of SDG 6. Using examples from South Africa, Uganda and Zambia, we identify some of the enduring challenges around providing sustainable access to water and sanitation in Africa. We illustrate that, although different African countries face different challenges in this regard, there is a common challenge around the huge disparities between rural and urban communities.

Keywords

Water and sanitation services · Inequality · Rural–urban divide

20.1 Introduction

Access to water and sanitation is widely recognised as indispensable to human existence and dignity. It is because of the centrality of water to sustaining human life that the United Nations (UN), in 2002, decided to officially recognise access to basic water and sanitation services as a human right. To support the recognition of water and sanitation services as a human right, the Committee on Economic, Social and Cultural Rights (CESCR) of the United Nations argued that the 'human right to water is indispensable for leading a life in human dignity'. The Committee further argued that the right to water 'is a prerequisite for the realisation of other human rights', observing that the fulfilment of other human rights, including the right to life, is reliant on meeting basic water and sanitation services (CESCR 2002, p. 1). It is, therefore, not surprising that access to water and sanitation was recognised as a separate sustainable development goal by the UN's General Assembly in September 2015.

In this chapter, we look at SDG 6, focusing on the challenges many African countries face to achieve the goal of making basic water and

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sanitation services available to all on a sustainable basis by 2030. We present data on the current levels of access to water and sanitation services in Africa to show that the biggest challenge in terms of realising SDG 6 in most African countries is overcoming the water and sanitation inequality between rural and urban areas. We present the experience of South Africa, Uganda and Zambia to highlight the water and sanitation inequality challenge. We argue that, while attention in public and policy debates is directed at the financial costs required to realise SDGs in general (Hutton and Varughese 2016; Begashaw and Shah 2017), it is crucial to understand how the non-financial aspects of SDGs, mainly management systems, impact not just on sustainable delivery of water and sanitation services but also on the sustainable management of water resources.

20.2 SDG 6: A Rallying Point for Collective Action

Although SDGs have been energetically proclaimed by the UN, critics argue that the SDGs are built on "wrong premises", primarily because they fail to acknowledge the constraint that the environment places on realising the economic and social development goals (Holden et al. 2016). While critics acknowledge the importance of recognising the moral imperative of overcoming poverty and promoting sustainable use of the planet's resources, they argue that although developmental goals (goals 1–6) are concrete and quantifiable, the environmental goals (goals 12–15) are unquantifiable with weak commitments, which are difficult to monitor and evaluate (Holden et al. 2016). To these critiques, one could add the concern, especially in the context of African and other low-income countries that the pledged collective action and partnership to support sustainable development in developing countries does not translate into anything tangible on the ground.

Despite these criticisms, the SDGs have become a rallying point for raising concerns around unequal access to and use of resources at both the domestic and global levels. One of the key resources of the earth championed by SDGs is access to water and sanitation, which is covered under SDG 6.

20.3 Content of SDG 6

SDG 6 pledges to 'Ensure availability and sustainable management of water and sanitation for all' by 2030 (UN 2015). This development goal has eight targets which include achieving universal and *equitable access* to safe and affordable drinking water for all by 2030 (6.1), attaining access to adequate and *equitable sanitation* for all (6.2), improving water quality (6.3), increasing efficiency in the use of water across all sectors (6.4), promoting the adoption and implementation of integrated resource management systems and principles (6.5), protect and restore water-related ecosystems (6.6), expand international cooperation and build capacity to support water and sanitation provision in developing countries (6a), and promote and strengthen participation of local communities in water and sanitation initiatives (6b, see ibid. 18–19).

A close look at the content of SDG 6 and its related targets reveals that there are two core aspects to this goal. The first is realising equitable delivery of water and sanitation services to *all,* which covers targets 6.1 and 6.2. The second dimension ties together the other targets (6.3 to 6b), which can be summed up as measures to manage the resources and the environment sustainably. These two dimensions of SDG 6 are intricately connected in the sense that sustainable and equitable delivery of water and sanitation services would not be possible without sustainable management of water resources and the environment in which water is found. The literature on water and sanitation services has often emphasised one of the two dimensions, which is problematic in terms of realising SDG 6. Sustainable provision of safe water and sanitation services is futile in a situation, where water resources are poorly managed. The point that has been rightly emphasised in the UN's Agenda

2030 is that the two dimensions of SDG 6 should be considered as two sides of the same coin.

The interconnection that is apparent between the various dimensions of SDG 6 is also evident between SDG 6 and other goals. For example, it is evident that SDG 6 is directly linked with SDG 11, which aims to ensure the equitable provision of "basic services" such as electricity, waste management, water and sanitation, among others. Similarly, SDGs 6 and 11 are connected with SDG 3, which focuses on waterborne diseases. It is this interrelatedness of SDGs which requires an inclusive approach where active participation of the broader sections of society becomes a precondition for success. The other key point that comes out of 2030 Agenda is the strong emphasis on equitable access to water and sanitation, suggesting that high levels of inequality in accessing water and sanitation is a sign that sustainable development principles are not being adhered to.

20.4 The Background to SDG 6 in Africa

A close look at SDG 6 in Africa today raises both optimism as well as an overwhelming sense of the challenge involved. There is optimism because commendable progress in making clean water, particularly, available to people in Africa has been made in most countries since the 1990s (Table 20.1). However, despite this laudable progress many African countries still face substantial challenges in meeting the targets outlined in SDG 6 by 2030. One of the challenges is reducing the large disparities in access to water and sanitation between urban and rural areas. The other area where most countries face huge challenges is in the sustainable management of water resources. We illustrate this challenge through examples from South Africa, Uganda and Zambia.

From Table 20.1, it is clear that most African countries have made commendable progress in terms of making safely managed water and sanitation services available to the people, especially in urban areas where access levels are significantly higher. Access to safe water sources improved significantly between 1990 and 2015 in all selected countries, except in Algeria and Zimbabwe (Table 20.1). Several countries such as Ethiopia, Guinea-Bissau, the Central African Republic, Malawi, Mali, Mauritania and Uganda recorded remarkable improvement, evident in the doubling of the ratio of the population with access to safe water in this period. However, it is important to note that progress has been made from a very low starting point.

In terms of sanitation, although the increases were not as large as those for water, most countries have made noteworthy progress, with Ethiopia, Tanzania, Mauritania, Cape Verde, Guinea-Bissau and Benin reporting the largest improvements. However, there are a number of countries, including Equatorial Guinea, Zimbabwe, Nigeria, Gambia and Djibouti, where access to safely managed sanitation was lower in 2015 than it was in 2000. Without downplaying the progress made in most countries, a significant number of countries still have very low levels of access to safely managed sanitation, with countries such as the Central African Republic, Ghana, Ethiopia, the DRC, Eritrea, Nigeria, Madagascar, Guinea-Bissau, Mozambique, Uganda, Tanzania, Sierra Leone and Benin reporting access levels lower than a third of the total population (see Table 20.1). For the African continent as a whole, access to safe sources of water increased by 22% between 1990 and 2015, while access to safely managed sanitation increased by only 8%. At this rate, it is likely that the continent as a whole is at risk of failing to meet the target stated in SDG 6 by 2030, as was the case with the Millennium Development Goal (MDG) 7 in 2015.

20.5 Water and Sanitation Inequality

While the ratio of the population with access to safe water is much better than the ratio for sanitation in most African countries, the challenge of meeting SDG 6 becomes evident when we disaggregate access to safe water by area of residence (rural and urban). Table 20.2 shows that

Table 20.1 Access to safely managed water and sanitation services [Authors' calculation from AfDB (2016) and United Nations Development Programme (UNDP) (2016)]

	Access to safe water %					Access to safely managed sanitation %			
	1990	2000	2010	2015	Change 1990–2015	2000	2010	2015	Change 2000–2015
Algeria	91	94	86	84	−7.7	84	86	88	2.5
Angola	35	38	47	49	40.6	32	46	52	62.5
Benin	54	63	75	78	43.4	12	17	20	66.7
Cameroon	44	62	72	76	73.5	42	45	46	9.5
Cape Verde	51	74	89	92	80.4	44	64	72	63.6
Central African Rep.	23	60	67	68	199.4	17	21	22	29.4
Congo, Demo. Rep.	36	45	51	52	43.2	23	27	29	26.1
Cote D'Ivoire	71	77	81	82	15.8	18	21	22	22.2
Djibouti	78	100	89	90	15.4	59	48	47	−20.3
Egypt	90	95	98	99	10.0	84	95	95	13.1
Equatorial Guinea	32	43	48	48	51.8	80	76	75	−6.3
Eritrea	47	46	56	58	23.4	11	15	16	45.5
Ethiopia	13	24	48	57	338.5	9	22	28	211.1
Gabon	65	70	91	93	43.1	39	41	42	7.7
Gambia	76	62	89	90	18.4	60	59	59	−1.7
Ghana	56	64	83	89	58.9	10	14	15	50.0
Guinea	53	48	73	77	44.2	13	18	20	53.8
Guinea-Bissau	36	49	70	79	119.4	12	19	21	75.0
Kenya	43	49	60	63	46.5	27	29	30	11.1
Lesotho	77	91	81	82	6.5	24	28	30	25.0
Madagascar	29	47	47	52	79.3	10	11	12	20.0
Malawi	42	57	81	90	114.3	34	39	41	20.6
Mali	27	65	67	77	185.2	18	22	25	38.9
Mauritania	29	37	54	58	100.0	24	36	40	66.7
Morocco	73	82	84	85	16.4	64	74	77	20.3
Mozambique	35	60	49	51	45.7	14	19	21	50.0
Namibia	70	77	87	91	30.0	27	32	34	25.9
Niger	34	59	54	58	70.6	7	9	11	57.1
Nigeria	40	57	63	69	72.5	34	31	29	−14.7
Rwanda	58	41	73	76	31.0	47	57	62	31.9
Senegal	60	78	75	79	31.7	40	45	48	20.0
Sierra Leone	37	28	57	63	70.3	11	13	13	18.2
South Africa	83	86	91	93	12.0	57	64	66	15.8
Sudan	67	75	55	–	–	25	22	–	–
Tanzania	54	54	55	56	3.7	9	13	16	77.8

(continued)

Table 20.1 (continued)

	Access to safe water %					Access to safely managed sanitation %			
	1990	2000	2010	2015	Change 1990–2015	2000	2010	2015	Change 2000–2015
Togo	48	54	60	63	31.3	11	11	12	9.1
Tunisia	83		96	98	18.1	82	89	92	12.2
Uganda	40	50	73	79	97.5	16	18	19	18.8
Zambia	49	64	61	65	32.7	41	43	44	7.3
Zimbabwe	79	85	78	77	−2.5	39	39	37	−5.1
Africa	59	61	68	72	22.0	35	38	38	8.6

Table 20.2 Access to improved source of water (rural and urban) 1990–2008 [Authors' calculation based on data from Gleick et al. (2011)]

	1990	2000	2005	2008	Change 2000–08	1990	2000	2005	2008	Change 2000–08
Algeria	..	88	88	85	−3.4	..	94	81	79	−16.0
Angola	73	34	54	60	76.5	20	40	39	38	−5.0
Benin	73	74	82	84	13.5	43	55	65	69	25.5
Cameroon	42	82	90	92	12.2	45	42	48	51	21.4
Cape Verde	..	64	86	85	32.8	..	89	82	82	−7.9
Central African Rep.	19	80	89	92	15.0	26	43	50	51	18.6
Congo, Demo. Rep.	68	89	82	80	−10.1	24	26	28	28	7.7
Cote D'Ivoire	57	90	92	93	3.3	80	65	67	68	4.6
Djibouti	..	100	95	98	−2.0	..	100	55	52	−48.0
Egypt	95	96	100	100	4.2	86	94	96	98	4.3
Equatorial Guinea	65	45	45	48	6.7	18	42	42	42	0.0
Eritrea	..	63	74	74	17.5	..	42	57	57	35.7
Ethiopia	..	77	95	98	27.3	..	13	24	26	100.0
Gabon	..	73	95	95	30.1	..	55	43	41	−25.5
Gambia	100	80	94	96	20.0	48	53	83	86	62.3
Ghana	63	87	89	90	3.4	..	49	68	74	51.0
Guinea	100	72	89	89	23.6	37	36	57	61	69.4
Guinea-Bissau	..	29	82	83	186.2	..	55	48	51	−7.3
Kenya	..	87	85	83	−4.6	..	31	48	52	67.7
Lesotho	..	98	96	97	−1.0	..	88	79	81	−8.0
Madagascar	..	85	71	71	−16.5	..	31	27	29	−6.5
Malawi	..	95	94	95	0.0	..	44	70	77	75.0
Mali	41	74	77	81	9.5	4	61	40	44	−27.9
Mauritania	..	34	49	52	52.9	..	40	43	47	17.5

(continued)

Table 20.2 (continued)

	1990	2000	2005	2008	Change 2000–08	1990	2000	2005	2008	Change 2000–08
Morocco	100	100	97	98	−2.0	18	58	60	60	3.4
Mozambique	..	86	76	77	−10.5	..	43	29	29	−32.6
Namibia	90	100	99	99	−1.0	37	67	82	88	31.3
Niger	98	70	89	96	37.1	45	56	37	39	−30.4
Nigeria	100	81	76	75	−7.4	22	39	40	42	7.7
Rwanda	84	60	80	77	28.3	67	40	63	62	55.0
Senegal	65	92	91	92	0.0	26	65	51	52	−20.0
Sierra Leone	80	23	82	86	273.9	20	31	33	26	−16.1
South Africa	..	92	99	99	7.6	..	80	75	78	−2.5
Sudan	..	86	68	64	−25.6	..	69	53	52	−24.6
Tanzania	..	80	82	80	0.0	..	42	45	45	7.1
Togo	..	85	86	87	2.4	..	38	40	41	7.9
Tunisia	..	95	99	99	4.2	..	81	84	84	3.7
Uganda	60	72	89	91	26.4	30	46	60	64	39.1
Zambia	..	88	87	87	−1.1		48	42	46	−4.2
Zimbabwe	95	100	99	99	−1.0	80	77	72	72	−6.5

Note [..] = data unavailable. Estimates for change in coverage ratio were only done for 2000 and 2008 due to many countries missing data for 1990

while over 80% of communities have access to safe water in urban areas there are lower access levels in rural areas. In countries such as the DRC, Sierra Leone, Madagascar, Mozambique and Ethiopia, less than a third of the population in rural areas had access to safe water in 2008.[1]

Even though access to safe water in urban areas is much higher than in rural areas in most countries, it seems that the focus is still on improving access to water in urban areas as evidenced by the higher growth rates for urban areas between 2000 and 2015. Only a few countries, such as Tanzania, Ethiopia, Eritrea, Cameroon, the DRC, Malawi, Ghana, Gambia, Benin and Uganda seem to be giving more attention to access to safe water in rural areas. In countries such as Zambia, Senegal, Sierra Leone, Niger, Mali, Cape Verde, Gabon, Djibouti, Mozambique and Guinea-Bissau, attention still seems to be directed towards urban areas, even when access levels in urban areas are significantly higher. This situation is perpetuating the water and sanitation inequality.

In the context of SDG 6, huge disparities in access levels indicate the challenge to realise the goal of equitable access for all, which is a core objective of SDG 6. A disaggregated analysis of access levels for different groups, such as formal and informal urban settlements and low- and high-density suburbs, also point to highly unequal access to safe water and sanitation, which poses a huge challenge in many African countries. Huge disparities exist in terms of access to water and sanitation between formal and informal settlements within cities (Chitonge 2014). Many countries are now realising that these disparities are a challenge, and are beginning to address the problem.

[1]Disaggregated data on water and sanitation are not readily available in most countries; we only had access to the 2008 data.

20.6 SDG 6 in South Africa, Uganda and Zambia

20.6.1 Water Policy and Governance

The persistent water supply deficit and disparities in many parts of Africa have been attributed to a water governance crisis (Asingwire 2008; Gupta 2011). In the context of SDG 6, a water governance crisis covers a broad range of issues from weak water and sanitation services supply systems to the inadequate implementation of policy measures adopted to protect water resources and the environment. Rees et al. (2008, p. 46) describe the key principles of water governance as 'decentralisation, participation, autonomy, accountability, efficiency, and financial and ecological sustainability'. In developing countries, the response to the water governance crisis has taken different shapes. Due to corruption, insufficient government budgets and weak public management systems, private sector participation —which was considered to be a solution to government failure and inefficiencies during the 1990s—has not played a significant role (Golooba-Mutebi 2012). One of the reasons for this is that privatisation of water and sanitation services has not delivered as many anticipated. The optimism about the role of the private sector in improving water and sanitation services has now subsided, particularly in poorer African countries. Few private firms are participating in the water sector, leaving the state and international donors to provide the necessary resources needed to run and maintain water resources and services infrastructure (Chitonge 2011).

20.6.2 Water Resource Management

In all three countries, we see the state taking a much bigger responsibility towards the management of water resources as well as the provision of water services. Principles of sustainable management of water resources have now started to feature in some of the relevant policy documents. For example, in Uganda, a review document that assessed the readiness of the country to implement Vision 2030 (SDGs) clearly stipulated that the country should focus on promoting inclusive and efficient management of water resources [Republic of Uganda (ROU) 2016]. Similarly, the revised water policy in Zambia has also highlighted the importance of managing water resources and its environment, arguing that sustainable management of water resources implies efficient management of the environment in which water is found [Republic of Zambia (GRZ) 2010]. In South Africa, where water resources are more scarce than in Zambia and Uganda, the policy emphasis has been on efficient management of the available resources, including shifting from supply- to demand-management approaches, rainwater harvesting, water re-use, desalination and utilisation of groundwater [Republic of South Africa (RSA) 2013].

20.6.3 Unequal Access to Water

While there is a growing awareness in the three countries about the need to sustainably manage water resources, it is evident that more work needs to be done around the unequal access to water and sanitation. In all three countries, access to water is highly unequal. If we look at the access levels for rural and urban areas as one aspect of water inequality, it is apparent that all three countries have a challenge in terms of meeting SDG 6 (Table 20.3).

Figures in Table 20.3 show that access to clean sources of water in rural areas is consistently lower than the access ratio for urban areas. While there has been tremendous progress, especially in Zambia and Uganda between 1990 and 2015, there are still large disparities—in Zambia almost half of the rural population still does not have access to safe water sources compared to 15% without access in urban areas. There are disparities between countries—for example, although South Africa and Uganda achieved their MDGs for water in 2010, Zambia failed to achieve this goal by 2015.

We do not have data for sanitation to illustrate the disparities in access levels between different

Table 20.3 Trends in access to improved sources of water by location (1990–2015) [Authors' calculation from AfDB (2016)]

	Urban	Rural	Urban	Rural	Urban	Rural	Total		
	Zambia		Uganda		South Africa		Zambia	Uganda	South Africa
1990	88.4	23.6	78.1	35.7	98.1	66.3	49.2	40.4	82.8
2000	87.3	34.7	85.4	52.4	98.5	70.6	53	56.4	86.5
2007	86.5	42.5	90.4	64.1	99	75.6	59	67.7	89.8
2010	86.2	45.8	92.6	69.1	99.2	77.8	61.4	72.5	91.1
2015	85.6	51.3	95.5	75.8	99.6	81.4	65.4	79	93.2
Change (%) 1990–2015	−3.2	117.4	22.3	112.3	1.5	22.8	32.9	95.5	12.6

groups or locations, but based on the aggregated data presented in Table 20.1, there is every reason to believe that access to safely managed sanitation would be characterised by similar, if not worse, disparities between urban and rural areas. For example, while the ratio of total access to safely managed sanitation facilities in 2015 for South Africa, Uganda and Zambia was 66, 19 and 44%, respectively (see Table 20.1), the access ratios in rural areas would be expected to be much lower than the national average as is the case with access to water.

As a UN report on SDG 6 observes, while national coverage ratios in most countries are quite high, 'widespread inequalities persist within and among countries' (UN 2016). Given SDG 6's commitment to making improved water and sanitation services available to all people, huge disparities in access levels between different groups pose a challenge to the realisation of the goal. We see, for instance that Zambia has a 34.3% difference between urban and rural access ratios. The gaps between rural and urban access levels are lower in Uganda (19.7%) and South Africa (18.2%) (see Table 20.3).

With specific reference to access to safe sources of water, it has been observed that in South Africa, "rural" communities carry the brunt as reliable access to water is limited. This is worsened by the lack of infrastructural maintenance and by inefficient management at local authority and community levels (Human Sciences Research Council (HSRC) 2016). The low levels of access to improved sources of water in rural areas in Zambia have been attributed to inadequate and poorly maintained infrastructure (Vision Africa Regional Network 2015). In Uganda, a study on rural water has shown that while urban residents travel an average of about 0.2 km to a water point, the average in rural areas is 1.5 km. In addition, the supply of water in rural areas is highly unreliable, and almost half (47%) of water sources surveyed in the study are not functional (Naiga and Penker 2015).

20.6.4 Water Management and Governance Is Crucial

While the water and sanitation inequality observed in many countries is often attributed to the lack of financial resources, it is also about the poor water resource management and governance. The issue of water governance is more apparent when we look at the water resource profiles in the three countries (Table 20.4).

Table 20.4 shows the difference in water endowment in the three countries. While Zambia has more than twice the amount of fresh water available compared to South Africa and Uganda, it has the lowest levels of access to water in both urban and rural areas and at the national level. The limited water resources in South Africa, evident in the fact that the country is at the water stress threshold of 25% withdrawal of renewable

Table 20.4 Water resource availability and use [Authors' calculation from Gleick et al. (2013) and AfDB (2016)]

Country	Year	Annual renewable water resources	Total freshwater withdrawal	Freshwater withdrawal % of total renewable water resource	Per capita withdrawal	Available freshwater per capita
		(km^3/yr)	(km^3/yr)	%	(m^3/p/yr)	m^3
S. Africa	2005	50	12.50	24.80	229	918
Uganda	2005	66	0.30	0.52	8	1 691
Zambia	2001	105.2	1.74	1.51	107	6 490

Water use							
	Domestic use	Industrial use	Agricultural use	2015 population	Domestic use/capita	Industrial use/capita	Agricultural use/capita
	(%)	(%)	(%)	(millions)	m^3/p/yr	m^3/p/yr	m^3/p/yr
S. Africa	31	6	63	54.49	77	15	156
Uganda	43	17	40	39.03	22	9	100
Zambia	17	7	76	16.21	31	13	141

resources (Falkenmark and Lundqvst 1989; HSRC 2016), have pushed the emphasis to managing and developing water resources sustainably, with a strong shift from supply- to demand-management approaches (HSRC 2016).[2] This is largely a water governance issue. Governance issues emerge from the second part of the table, which show the use of water in the three countries. Although these aggregate figures hide the disparities between different groups of water users, it is apparent that agriculture uses more water resources. The challenge here is governance: how water resources are managed and utilised.

20.7 Challenges to Achieving SDG 6

Given the data discussed above, the challenges in achieving SDG 6 are apparent. These range from inadequate infrastructure and funding levels, growing populations especially in informal settlements where people often live under sub-human conditions, to the effects of climate change which impinge on freshwater availability. A few key issues are discussed below.

20.7.1 Infrastructure and Funding

Diarrhoeal diseases, resulting from drinking unsafe water and poor sanitation, account for 7% of deaths in Africa every year (World Health Organization 2016). As a result of this, addressing issues of access to safely managed water and sanitation has always been an urgent matter in most African countries. Many countries in Africa have responded by expanding the water and sanitation infrastructure to their unserved populations. These national efforts have been complemented by international financial and technical assistance, but this source of funding has not always been reliable. A number of countries have prioritised water and sanitation infrastructure as a means to reduce the risk of waterborne diseases (Brookes and Carrey 2015). Building adequate and regularly maintained infrastructure has been a challenge in many countries, especially in rural areas, as the examples from South Africa, Uganda and Zambia show.

[2]At 918 m^3 per capita of freshwater availability, South Africa is below the water stress threshold of 1000–1666 m^3 per capita (Falkenmark and Lundqvst 1989). With a 24.8% withdrawal of renewable freshwater, South Africa is just on the threshold which is 2%. The 24.8% figure is for 2005, the current withdrawal ratio is slightly higher than this [see Hadden (2016) for details].

20.7.2 Climate Change and Water Resource Availability

As noted above, the challenge of realising SDG 6 is not just about making clean water available, but also managing the environment in which water resources are found. Essentially, this means that the discourse around SDG 6 needs to be located within the broader debates on climate change and the constraints this imposes on the availability of water (see Holden et al. 2016). Climate change affects the water cycle in various ways, including rising atmospheric temperature. In some regions, global warming is causing heavy and sporadic rainfall, leading to flooding, as was the case in some parts of Zambia, Mozambique and Zimbabwe, earlier in 2018. On the other hand, global warming reduces rainfall in sub-tropical climate regions, causing irregularities in the water cycle, resulting in droughts, such as Uganda and South Africa have experienced in 2018.

20.7.3 Socio-Economic Inequalities

The other major challenge is the inequality in accessing safely managed water and sanitation. The realisation of the targets of SDG 6 is premised on establishing effective partnerships at the regional, national and international level to overcome the current disparities in access. The difficulties of establishing effective partnerships at national and international level to create conditions for narrowing inequalities are seldom discussed at water forums and conventions because, for decades, they have been deemed irrelevant. One of the reasons for this is that the majority of people who are affected by the structures of unequal access to water resources are excluded from decision-making processes.

20.7.4 Inefficient Use and Management of Water

Another threat to the prospect of realising SDG 6 in Africa is that of inefficient management and use of water resources. Reckless usage of water aggravates water scarcity and inequality (Johnson et al. 2016, p. 1). The commodification of water exacerbates water and sanitation inequality, mainly because the private sector service providers have no interest in extending services to poor areas (Chitonge 2011). It leaves decision-making over the distribution of water to people whose main goal is to make a profit rather than to provide public goods (Johnson et al. 2016). As a result, poorer communities receive less attention.

20.7.5 Rapid Urbanisation

Many African cities are experiencing rapid growth of the urban population, mostly in informal settlements where services are poor. The challenge lies in providing quality services to poorer sections of the urban population. What makes the situation worse is that national governments do not have adequate resources to provide water and sanitation services to the growing population, especially the informal settlements.

20.7.6 Political Commitment

SDGs are meant to achieve some of the objectives the MDGs failed to address. To achieve the goals outlined in the SDGs, political commitment at the national level is a crucial factor. In the case of African countries, the lack of commitment from politicians and policymakers has contributed to the failure to realise MDGs. Lack of commitment in the context of the SDGs is reflected in the low budgetary allocation given to water services, for instance (Chitonge 2011). If the business-as-usual approach continues, there is no likelihood that the SDGs will be realised by 2030. Apart from statements in policy documents, there is little to show that African heads of state have seriously committed themselves to funding and implementing the initiatives aimed at improving water and sanitation, especially among the poor. This lack of political commitment threatens the

progress of making SDG 6 a reality on the continent.

20.8 Prospects for SDG 6 in Africa

While there is an array of challenges that African states have to grapple with in their quest for realising sustainable development, significant progress is being made in some countries in terms of formulating policy and strategies. For example, Uganda was one of the first countries to develop its national development plan in line with the SDGs, with an estimated 76% of the SDG targets reflected and adapted to the national context (ROU 2016). At the continental level, African states signed the Common African Position (CAP) on post-2015 development, in which countries pledged to work together to ensure that the goals are realised. This agreement also draws on the African Union's efforts to promote sustainable development on the continent.

One area which will determine the rate at which SDG 6 will be realised in Africa is that of governance. Governance is a broad concept, with different dimensions (Biswas and Tortajada 2010; Araral and Wang 2013). Good governance is characterised by transparency, accountability, equality and efficiency, and promotion of broader participation in various public policies. However, the good governance agenda has been criticised for the failure to empower community and civil society groups (Carter et al. 1999). Adherence to principles of sustainable development will require developing norms for promoting good governance and management of public resources, including water resources. While this will remain a challenge in many African countries, there are signs that collective action at the African Union level can push countries to begin to adopt some of the best practices. The current institutional arrangement in most countries does not promote an integrated approach to issues such as water and sanitation. There is a need to create an appropriate regulatory framework to ensure accountability and equity in the provision of water services.

20.9 Conclusion

SDGs are complex and require a multi-dimensional approach. In this chapter, we have highlighted the challenge that arises from inequality in access to water in most African countries. We emphasise that overcoming water and sanitation inequality is not just a matter of securing adequate financial resources as the debates on SDGs tend to suggest. Ensuring that no one is left behind in the provision of water and sanitation is mainly a governance issue at both international and domestic levels. In addition to the huge financial resources needed, political will is required to ensure environmental and social justice in the provision of water and sanitation services. If African countries are to realise the targets outlined in SDG 6, there has to be a new funding formula for water and sanitation. The challenge for most African countries is that governance systems are weak and the political commitment to SDGs does not seem to go beyond the formulation of policy. To uphold these policies, African states should be rigorous in implementation campaigns and prioritise accountability.

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21 Achieving SDG 14 in the African Small Island Developing States of the Indian Ocean

Erika J. Techera and Krishnee A. Appadoo

Abstract

Humans are inextricably connected to the ocean, yet the challenges facing marine areas and resources have received little global attention until recently. For the first time, the Sustainable Development Goals (SDGs) explicitly include marine issues. SDG 14 focuses on 'life below water' and the conservation and sustainable use of oceans and resources. SDG 14 is particularly important for the African island States in the Indian Ocean as they rely heavily on marine resources for economic development, livelihoods and sustenance. These countries also have blue economy agendas centred on achieving future wealth from the oceans. These micro-jurisdictions are often overlooked, but deserve greater attention as they are small island developing states (SIDS) or least developed countries (LDCs) with limited resources to address ocean issues, and have emerging innovative approaches that that may offer broader lessons to other maritime nations. This chapter explores efforts made to achieve SDG 14 sustainable fishery management goals by focusing on the small-scale artisanal fishing sector in the Indian Ocean SIDS and effective collaborations between governments and communities.

Keywords

Oceans governance · Gender · Fisheries management · Indian Ocean · Small Islands

21.1 Introduction

Maintaining healthy oceans and marine resources is critical to a range of human and environmental concerns. Oceans have historically provided food and other resources, the means to transport goods, livelihoods and economic development opportunities, as well as being associated with a range of recreational activities and cultural beliefs. Increasingly, renewable energy is harnessed from the oceans, and marine biodiversity is now revealing its value for emerging biotechnology industries. Yet it is not only human concerns and values, which are important; oceans provide ecosystem services including maintaining climate and weather systems, acting as a carbon sink and absorbing other wastes, in addition to the intrinsic value that marine life has in and of itself.

Ocean health is critical to all life on Earth, but many years of resource exploitation, pollution and habitat damage have led to degradation of marine environments and species living within

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them (Halpern et al. 2008). Significant efforts have been made to address these issues through international, national and local laws, as well as a variety of programmes and projects. It is in this context that Agenda 2030 included a Sustainable Development Goal (SDG) focused specifically on oceans (United Nations (UN) 2015). SDG 14 —'Life Below Water'—centres on the need to 'conserve and sustainably use the oceans, seas and marine resources for sustainable development' (UNDESA 2018). Most of the targets in SDG 14 exist in other international instruments and documents, but the inclusion of an oceans-focused SDG was a significant step in highlighting the need for action to address ocean health, missing from the earlier Millennium Development Goals (UN 2000). SDG 14 sets seven targets, plus an additional three goals, all with indicators:

- 14.1 By 2025—Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution;
- 14.2 By 2020—Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans;
- 14.3—Minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels;
- 14.4 By 2020—Effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics;
- 14.5 By 2020—Conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information;
- 14.6 By 2020—Prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognising that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation;
- 14.7 By 2030—Increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism;
- 14.A—Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries;
- 14.B—Provide access for small-scale artisanal fishers to marine resources and markets;
- 14.C—Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The Future We Want".

Although the targets in SDG 14 are important in their own right, they do not stand in isolation. They play a cross-cutting role and their achievement is inherently linked to each of the other SDGs (International Council for Science 2017). Equally, it is clear that within SDG 14 the separate targets are connected to each other. The issues explored in this chapter—sustainable fishery management, artisanal fishing and small island developing states (SIDS)—sit at the intersection of SDGs 14.4, 14.7 and 14.B.

Globally, fisheries management remains a challenge with over 30% of fish stocks harvested

at unsustainable levels and a decreasing percentage are fished at sustainable levels; the state of the world's fish stocks has not improved (Food and Agricultural Organization (FAO) 2016). Ensuring sustainable fisheries management is a particular challenge for the African SIDS in the Indian Ocean, where coastal communities rely heavily on marine resources for food and livelihoods, and national economies depend upon (often foreign fleet) commercial fishing in offshore areas. SIDS' limited financial resources and geographic isolation combined with relatively small land areas means that there are few alternative options to provide food security and economic development. This illustrates how important ocean health is to these countries and therefore their interest in achieving the goals of SDG 14.

This chapter focuses on the SDG 14 fishery management targets and the particular role of small-scale artisanal fisheries. The importance of this sub-sector has been recognised as it provides a combination of food security, livelihood and economic benefits, contributing most noticeably in developing countries (Allison and Ellis 2001). This has now been acknowledged in SDG 14.B itself. Government–community collaborations are critical in the context of small-scale fisheries, and the role of women in Mauritius, Seychelles and Comoros is specifically highlighted here.

The chapter commences by exploring African engagement in addressing ocean challenges and the particular context and vulnerabilities of SIDS. SIDS involvement in African SDG 14 is examined along with the ways in which regional initiatives have assisted SIDS. The next section analyses the importance of fisheries to Mauritius, Seychelles and Comoros in the context of the blue economy, as well as the overall role and importance of the artisanal sector. Thereafter specific case studies illustrate where government and communities are working together to achieve the goals of SDG 14. Collaborative initiatives highlight the particular role of women in sustainable fisheries. The final section identifies broader lessons that may be of value to other countries and communities grappling with similar issues.

21.2 Africa, Small Island States, Ocean Challenges

Africa has engaged with oceans issues from a regional perspective for some time. Most countries are parties to key treaties such as the United Nations Convention on the Law of the Sea (1984) and the Convention on Biological Diversity (1992), and they are members of the Food and Agriculture Organisation (FAO) that has developed the Code of Conduct for Responsible Fisheries and initiatives on small-scale fisheries (FAO 2018). At the regional level, attention has been paid to marine resources including through the Abuja Declaration on Sustainable Fisheries and Aquaculture in Africa adopted in 2005. It has been noted, however, that African maritime policy is economically focused, centred strongly on wealth from the oceans (Walker 2017). This can be seen through the African Union's Agenda 2063, where the only reference to marine living resources is in the context of development of fishing and exploitation of other resources (African Union Commission 2015), as well as the emergence of national blue economy agenda including in the small island states (Commonwealth Secretariat 2018).

One of the most recent regional developments is the African Charter on Maritime Security and Safety and Development in Africa (Lomé Charter 2016). The objective in Article 3 includes suppression of maritime security threats such as illegal, unregulated and unreported (IUU) fishing, protection of the marine environment and promotion of sustainable blue economy agenda. The meaning of the additional objective to 'further sensitise communities living next to seas for sustainable development of African coastline and biodiversity' is ambiguous, although Article 4 makes it clear that exploitation and 'optimisation of the development opportunities' are key priorities. Article 20 focuses on fisheries and aquaculture calling for conservation and sustainable utilisation policies with reference to employment, food security and economic diversification opportunities. Although some of these provisions align with SDG 14, no specific reference is made

to this goal. Furthermore, the broader importance of ocean areas and marine ecosystems for building resilient communities, as well as economic development and food security is not addressed. These are all matters of particular importance for SIDS.

The African SIDS in the Indian Ocean contribute minimally to the continent in terms of populations and land areas but their Exclusive Economic Zones (EEZs) are extensive. Mauritius has a land area of only 2,040 km^2 but an EEZ covering of 2,300,000 km^2 (Republic of Mauritius 2014). Comoros has a similar land area to Mauritius and an EEZ totalling 164,777 km^2 (FAO 2015). Seychelles has a smaller land area of 455 km^2 but an EEZ of 1,300,000 km^2 (SmartFish Programme 2014). These States are less vulnerable to sea level rise than their low-lying atoll neighbours, but the height and terrain of inland areas has meant that populations are largely found around the coasts. These coastal communities have developed particular dependence upon the oceans for food and livelihoods directly related to oceans and coasts. The small land areas also mean that agricultural opportunities are relatively limited and national economies rely upon fisheries and tourism sectors. In Mauritius for example, it is estimated that the ocean economy currently contributes 10% to GDP (Cervigni and Scandizzo 2017); in Seychelles and Comoros fisheries is the second largest sector (SmartFish Programme 2014; United Nations Conference on Trade and Development (UNCTAD) 2017).

This historical reliance on marine areas and resources has led to the emergence of blue economy agenda. As with Africa more broadly, much attention is paid to wealth from the oceans but sustainability, equity and resilience are also considerations. The Seychelles Blue Economy Strategic Policy Framework and Roadmap, for example, focuses on creating sustainable wealth, sharing prosperity, securing healthy and productive oceans and strengthening the enabling environment (Commonwealth Secretariat 2018). Four key pillars include economic resilience, shared prosperity, food security and well-being, and integrity of habitats and ecosystems. Seychelles has articulated blue economy principles that include economic factors balanced with sustainability, social equity and resilience. Mauritius has recognised 'significant potential for the development of a modern and prosperous marine and fisheries based sustainable industry' (Republic of Mauritius 2014), but achieving this on the ground is likely to remain a challenge. It is in this context that analysing case studies involving enhanced sustainability of fisheries in the SIDS are of value.

21.3 Small-Scale Fisheries and the Islands States

SDG 14.4 and 14.7 are expected to be better achieved in developing countries through artisanal and small-scale fisheries rather than growth in the industrial fisheries sector; this is reflected in part in SDG 14.B and recognised in SIDS themselves (Commonwealth Secretariat 2018). In Mauritius, for example fishing has been the major provenance of income for coastal families, and fishing is regarded not only as a source of financial sustenance but also as a family tradition transmitted from generation to generation. Small-scale fisheries provide local livelihoods as well as ready access to nutritious food for coastal communities (Allison and Ellis 2001; Hauzer et al. 2013). Therefore, government initiatives to support this sub-sector are critical to achieving the goals of SDG 14.

Local fishing communities especially small-scale artisanal fishermen and fisherwomen are also directly impacted by the degradation of reefs and lagoons. The changing marine environment was captured by Georgie, an artisanal fisherman earning his living fishing octopus in the Mauritian lagoons: 'When I started fishing with my father, there were a lot of fish and octopus… But now, it's tough for us to make a living. We need to take on several jobs. The fishing profession is disappearing' (Harel 2017). To respond to this reality encountered by many fishing communities in Mauritius, the Ministry of Fisheries was subsumed within the Ministry of Ocean Economy, Marine Resources, Fisheries,

Shipping and Outer Islands (MOE) in 2014, with a broader vision to 'conserve and use the oceans, seas and marine resources for sustainable development' (MOE 2018). This has allowed the Ministry to sponsor new initiatives, some of which are explored below.

Gaps in knowledge about the people involved in local fishing activities, as opposed to data about fish stocks and productivity, inhibits the development of responses to support them. This is particularly the case in relation to women's role in fisheries (Williams 2008; Fröcklin et al. 2013). Although women play an important part in world fisheries, the focus has tended to be upon men (Harper et al. 2013). Women are commonly involved in pre- and post-harvesting activities such as financing, processing, marketing as well as net-mending, bait collection and taking care of male fishers (Fröcklin et al. 2013). Very little research centres on women directly involved in fish harvesting although this is known to occur in some places (Hauzer et al. 2013). Lack of information can lead to significant problems in terms of policy development and therefore can negatively impact on future opportunities to scale up sustainable activities in pursuit of SDG14.

The extent of the challenge is highlighted by an example from Comoros where women have been directly involved in harvesting fish on Ngazidja Island. Here the government sought to ban women from traditional reef gleaning and harvesting intertidal zones on the basis that practices were unsustainable, causing damage to reefs and juvenile fish stocks. The study by Hauzer et al. (2013) analysed these activities and found that women themselves confirmed declining fish stocks, but they also suggested solutions including periodic closures, prohibiting certain gear and techniques and limiting the size of fish legally caught. This example shows that not all small-scale enterprises are sustainable and draws attention to the need for further research to understand problems and solutions. If the Ngazidja Island women are banned from fishing then it will leave them without valuable food security and employment options, and lack of alternatives might mean the law is completely ineffective.

The above example underlines the value of having accurate information about the small-scale fisheries sector in specific national and local settings, and also demonstrates the requirement for further knowledge about women's role in artisanal fisheries. Equally important are examples of initiatives that have been successful. The section that follows highlights several recent government-community collaborations that are reaping rewards and may provide translatable options for other contexts.

21.4 Case Studies

In order to respond to marine stress and declines in fish stocks, Mauritius has introduced seasonal closures of some fisheries. This success story was inspired by an initiative taken by Rodrigues—an autonomous island but still governed by the Republic of Mauritius. Rodriguans' main economic activities include subsistence farming and fishing. Due to overfishing of octopus, which is the principal seafood on which fishermen in Rodrigues depend, harvests fell by up to 60% between 1994 and 2004 (Harris 2007). In response, the autonomous government implemented a series of seasonal closures (Jhangeer-Khan et al. 2015). The government's initiative involved the collaboration of SmartFish, a program of the Indian Ocean Commission (IOC). Statistics indicate that the catch in Rodrigues, after the experimental closure, were almost twice the landings in each year from 2006 to 2010 (when the seasonal closure was not yet in place) (Yvergniaux, undated). This resulted in a financial gain of MUR16,920,000 (US$483,912) benefiting the fishing community in Rodrigues as well as the Rodriguan economy as a whole (Jhangeer-Khan et al. 2015).

Following on from this success, Mauritius set up a pilot project in 2015 to operate a voluntary octopus fishing closure in response to reductions in harvests (Republic of Mauritius 2016). Under the aegis of the Mauritius MOE the pilot involved a collaboration between the IOC, local NGOs and the UNDP's GEF Small Grant Programme. One year later in 2016, a national

seasonal octopus closure was announced and regulations were enacted to close waters from August to October (Republic of Mauritius 2016). Community awareness raising was a key element for the partnership with government to be effective; local NGOs also launched a national public information campaign. This project inspired the creation of a 22-min video, "Vey Nou Lagon" (Protect our Lagoons) which was screened free of charge to targeted members of the public such as fishermen, and to engage the fishing families affected by the dwindling supply of octopus in Mauritian lagoons.

Madagascar is another island State, albeit not a SIDS, that also practises the seasonal closure of octopus fishing, first introduced in 2007. As with Rodrigues, in south-western Madagascar octopus fishing is a valuable activity for coastal communities, providing both food and livelihoods. Following noticeable declines in harvests in 2004, an NGO worked with local communities to establish a voluntary seasonal fishing closure. The closure resulted in significantly increased harvests and income (Blue Ventures 2017). The initiative sparked a number of other fishery closures and the communities becoming involved in the Locally Managed Marine Areas (LMMAs) initiative which had been successful in the Pacific (LMMA Network 2018).

In Rodrigues, most fisherwomen are known as 'piqueuses d'ourites' or 'octopus hunters' and are traditionally involved in earning extra income by catching, cleaning, washing, drying and salting octopus which is later sold either by themselves or third parties, while their husbands are fishing on boats. Resale of fish and fishery products by women entrepreneurs is also a feature in Comoros, leading to a unique profession known as 'dealer'. For example, in Great Comoros, women known as '*watchouzi*' almost exclusively carry out this work: the fishermen either sell to a woman within his family (wife, mother, sister) or another woman who does not live in his village, and who in turn sell the fish on the wider market (Hanoomanjee 2017).

In Mauritius, the battle to empower women to become entrepreneurs in sustainable fisheries is ongoing, because fisherwomen are a rarity in a job that is seen as being male-dominated. Ginette, a fisherwoman living in the north of the island, admits being regarded by men in her village as 'an intruder in the profession', and receives little support from other women who 'mock [her] for doing a man's job' (Ackbarally 2010). However, Ginette added that entry into the fishing profession was made possible by the support of an NGO called 'Movement for Food Security', that encourages women to join fishing and the aqua-business. This confirms the changing nature of the artisanal fishing sector in Indian Ocean SIDS.

One example of national effort to boost women's entrepreneurship in local aquaculture, in line with the objectives of the ocean economy, is seaweed culture. This has been steadily developing in Mauritius and Rodrigues, especially on the eastern coastal region of the main island. These naturally produced algae are harvested by women, who have been trained to convert them into cosmetic products, notably hand-made soaps (Indian Ocean Times 2017). This project, initiated by the MOE, is also co-managed by the Association of Women Entrepreneurs, thus supporting artisanal fisherwomen in Mauritius. It can, therefore, be seen that since 2014, the Mauritian government has been investing in capacity building for women to embrace jobs related to the ocean economy. A 2003 study by the ILO reported that women entrepreneurs were absent in the agriculture and fishing sectors in Mauritius (Day-Hookoomsing and Essoo 2003). Almost 15 years down the line, this is no longer the case. Government-led organisations such as the Mauritius Women National Entrepreneur Council (NWEC), the National Institute of Cooperative Entrepreneurship (NICE) and the Small and Medium Entrepreneurship Development Authority (SMEDA) have increasingly developed programmes, initiatives and projects to build the capacity of women entrepreneurs in the fishing sector. Specific focal areas include access to finance, training budding women entrepreneurs in the development of values and principles of

cooperation and effective management, as well as endowing them with the knowledge and skills necessary to survive as independent, resourceful and resilient women entrepreneurs (ION News 2014).

The above example is similar to what is termed 'algaculture', an innovative project launched in 2012 by the Asia Pacific Network-Global Change Research and the South Asian Forum for Environment, to promote the cultivation of algae in fields covered by seawater. Rice farming in some regions of Bengal in India had suffered tremendously as a result of paddy fields being submerged under '2 feet of brackish water throughout the year, and increasing salinity poisoning of the soil' (United Nations Development Programme (UNDP) 2015). The algaculture project has been a resounding success since 2012 and has involved 100 beneficiaries (UNDP 2015). Dey, the project leader, affirmed the importance of recognising the tremendous potential of women to be principal algae producers and collectors. As such, capacity-building workshops were carried out to train women in 'harvesting, identification of the alga species, pond preparation and cultivation management' (UNDP 2015). Thus, a project that originated in another part of the Indian Ocean region has now been taken up in the SIDS. Cross-border cooperation through regional organisations and UN agencies, is likely to remain important in the future.

The GEF-Satoyama Project is another example of global engagement translating into targeted local initiatives. This Project directly addresses the SDGs by focusing on the intersection of biodiversity conservation and sustainable management. The Indian Ocean islands have a variety of sub-projects, including in Seychelles where an NGO is working with local groups on designing a community-based marine management plan to reduce bycatch and minimise the impact of the Seychelles artisanal fishery on threatened species (GEF-Satoyama 2018). The Seychellois example adds to an initiative in Mauritius, where an historical fishpond (*barachois*) is being revitalised for fish farming.

21.5 Analysis and Lessons Learned

The above analysis shows that multi-scale collaborations are needed to advance sustainable small-scale fisheries as part of SDG 14. Much can be learned from other contexts, and in turn, the examples highlighted above may offer ideas for other countries. At the local level, community buy-in is important, particularly where restrictions (such as seasonal closures) are suggested to improve sustainability. Pilot projects combined with awareness-raising initiatives provide opportunities to build trust and confidence. Government support for development projects is also essential particularly where new value-add livelihoods are being established.

Invisibility and the lack of information about women in fisheries has led, in part, to male fishers benefiting disproportionately from fishery development projects (Bennett 2005; Hauzer et al. 2013). Other factors are also at play including traditional divisions between genders, as well as cultural beliefs and norms (Fröcklin et al. 2013). These divisions, however, are reducing over time and decision makers must recognise this. To ensure community-based policy interventions have maximum effectiveness they must engage with women in fisheries (Bennett 2005).

The role of women in Indian Ocean small-scale fisheries continues to be important; this finding aligns with research in other island communities such as Palau where women have historically always been involved in fishing and gendered roles are breaking down (Williams 2008), as well as Zanzibar where women are increasingly involved in fish trading (Fröcklin et al 2013). The Palau example also highlights the importance of research, by academics, government agencies and associations tasked with advancing sustainable fisheries management. More research is needed in Mauritius, Seychelles and Comoros to inform future initiatives and ensure responsive management.

The Mauritian and Comoros case studies also illustrate situations, where traditional practices were not sustainable and responses were needed

to protect habitats and fish stocks. The initial government reaction in Comoros was to prohibit women from fishing, with the risk of a range of perverse outcomes. Yet the women themselves identified some potential interventions that would avoid an outright ban on fishing. In the Mauritian example, communities accepted that seasonal restrictions on octopus fishing were necessary to maintain stocks and therefore livelihoods. This draws attention to the need for participation of all stakeholders in designing ways forward. As noted by Bennett (2005, p. 458) 'fisheries development policy needs to look beyond the resource to the stakeholders'.

21.6 Conclusion

The health of our oceans is critical to life on earth, human or otherwise. The inclusion of an SDG specifically focused on oceans is, therefore, a welcome step forward. Sustainable management of fisheries is a key component of ensuring healthy marine environment. The problem lies in the implementation of focused programmes and directed interventions to meet the targets. This is particularly difficult for resource-poor SIDS yet there are positive examples to draw upon. Focusing on African SIDS in the Indian Ocean, this chapter has demonstrated that governments must embrace both the challenge and the opportunity of small-scale artisanal fisheries involving all stakeholders in designing ways forward. Only then can life below water be ensured for future generations of women and men.

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Part III

Africa and the SDGs: The Role of Collaborative Research

The SDGs and African Higher Education

22

Han Aarts, Heinz Greijn, Goolam Mohamedbhai and James Otieno Jowi

Abstract

Higher Education (HE) has a crucial role to play in realizing the sustainable development agenda and achieving the Sustainable Development Goals (SDGs). SDG 4 deals specifically with education and calls for equitable access to affordable and quality post-secondary education. That is important, especially in Africa, but, as the authors will argue, the role of HE and of Higher Education Institutions (HEIs) can and should go beyond that. The first 16 SDGs address virtually all aspects of life, and HEIs should respond to them comprehensively. Indeed, the SDGs offer an opportunity for African HEIs to boost their societal relevance. This chapter explores ways in which this might be achieved.

Keywords

Higher education institution · Quality education · Sustainability · Capacity building

22.1 Introduction

Higher education (HE) in any part of the world, and certainly in Africa, has a crucial role to play in promoting global and local sustainable development, especially when development is seen as encompassing economic and non-economic dimensions of development. HEIs educate future professionals, researchers, intellectuals and leaders. Universities also conduct fundamental and applied research through a process of communicating with many other actors and society at large. In this way universities can lead and drive research and innovation crucial to achieving sustainable development (Sedlacek 2013; Aarts and Bruun 2016). As such, 'higher education underpins all development targets from poverty reduction to employability, health to environmental sustainability' (Association of Commonwealth Universities 2015, p. 1). Or, putting it in another way, it is unthinkable that sustainable development can be achieved *without* a significant concerted effort from the HE sector, whether globally or specifically in Africa.

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Currently there is a growing interest, in the global as well as in the African HE community and among HEIs, in the sustainable development agenda and its implications for HE, which is now frequently discussed in various fora and within institutions (IAU 2017, Sustainable Development Solutions Network 2017). Also, there is a growing number of publications on the theme (Sehoole and Knight 2013). It is beyond the scope of this chapter to comprehensively review all ongoing efforts and relevant publications here. Instead, the authors address the following questions related to African higher education: How can teaching and learning contribute to achieving the SDGs? What can be achieved specifically through (further) internationalisation? What can be done to optimise the efforts of African HEIs to develop new knowledge that is relevant for achieving the SDGs and to enhance the uptake and application of new knowledge? What can be the contribution of community outreach and engagement efforts? And finally, is there a unique role for African universities in implementing the Global Sustainable Development Agenda?

22.2 Teaching and Learning

22.2.1 Increasing Enrolment

Achieving the SDGs will require a large output of trained personnel in a variety of fields and this can only be achieved through higher education institutions. For example, ending hunger, increasing agricultural productivity and ensuring sustainable food production (SDG2) require scientists and agronomists; reducing maternal and infant mortality and tackling communicable and non-communicable diseases (SDG3) need medical doctors, nurses and many other health professionals; ensuring inclusive and equitable quality education (SDG4) can only be achieved through well-trained teachers; and ensuring availability of water and sanitation (SDG6) or access to reliable and modern energy (SDG7) or adequate and affordable housing and services to all (SDG11), as well as promotion of sustainable industrialisation (SDG9), all require engineers, architects and technologists.

The question, however, is whether African higher education systems have the capacity to significantly increase their output of appropriately trained quality graduates in the relevant and necessary fields to meet the SDGs. In 2016, the gross tertiary enrolment ratio for sub-Saharan Africa was of the order of 9%, which was lower than for any other developing world region (World Bank 2018). Only about a decade ago that figure was just 6%. Public higher education institutions have made enormous efforts to increase their student enrolment but unfortunately, this has been to the detriment of quality. Most of the institutions have increased their enrolment without significantly increasing their staff, their physical infrastructure, without a commensurate increase in government grants and mostly in areas of social sciences and humanities instead of science and technology (S&T). This has resulted in a deterioration of existing infrastructure, a lack of qualified academic staff, a shortage of laboratories and equipment for S&T-based programmes and increasing unemployment of graduates. In parallel, Africa has witnessed an increase in private higher education and cross-border institutions, many of them operating as business enterprises, often providing poor quality education and covering areas not necessarily appropriate for Africa's development.

Most African governments may not be in a position to provide additional public funds for a substantial increase in tertiary enrolment, perhaps to 30–40% by 2030, necessary for promoting sustainable development. They may therefore have to resort to new models of funding of public institutions, including the unpopular measure of increasing the share of funding through students' fees. Private providers would also have to significantly increase their enrolment. All these measures would call for an increased monitoring of quality and relevance of higher education provision, which is quite a challenge.

However, the significant increase in tertiary enrolment should not be in the university sector alone. Differentiation of the tertiary sector is vital

for Africa to achieve the SDGs. There is a dire shortage at present in Africa of trained personnel at the technical and middle-management level. Polytechnics, technical colleges, etc., which offer sub-degree programmes that are less rigorous academically but more practically and vocationally oriented, with close links with industry, have therefore a vital role to play in Africa's development. There has been a recent trend in several African countries of converting their polytechnics to universities. It is questionable whether this strategy is wise in the context of what is needed for sustainable development in Africa.

22.3 Promoting Sustainability Through the Curriculum

In addition to producing more trained personnel, higher education is to be a key agent for promoting sustainable development. By incorporating elements of sustainability in their teaching and learning functions, higher education institutions should be able to significantly influence the future thinking and attitude of their students and graduates towards sustainability.

There are two approaches that can be used for introducing sustainability at undergraduate level (Mohamedbhai 2012). First, a separate module on sustainable development for all students could be introduced during the first year to facilitate students' understanding of the basic concepts of sustainability and help create awareness of the national, regional and global challenges. Second, sustainable development could be mainstreamed in all curricula, especially in engineering, agriculture, architecture, etc. courses to enable students to be conscious of the environmental, social and economic impact of their respective profession. This was the objective of Mainstreaming Environment and Sustainability in African Universities (MESA), a major initiative spearheaded by United Nations Environment Programme (UNEP) since 2004 in partnership with several African universities (UNEP 2017). In 2010, a survey of 65 African universities revealed that 59% of them were not mainstreaming sustainable development into their curricula (GUNI-IAU-AAU 2011), a clear indication of greater efforts needed by African universities. Those that were doing so were mainly in the fields of natural and social sciences rather than in applied and physical sciences, health and medical sciences, and education.

Another important contribution that higher education can make in achieving the SDGs is in the training of teachers for the lower education sectors. It is at primary and secondary school level that introducing sustainability principles to learners can have the greatest impact in their later lives. It is vital that the curricula of all teacher training programmes incorporate sustainability concepts. There is also a need to re-train existing teachers not familiar with sustainable development issues.

At postgraduate level, a generic programme, preferably at Master's level, can be very useful for graduates working in any field but who need to be conversant with sustainability principles in their work. Such a programme should include policy, advocacy and legal aspects of sustainable development. Critical areas such as deforestation, water resources, climate change or urban planning may require more specialised postgraduate courses (Mohamedbhai 2012). An interesting example is the regional Masters' degree in Climate Change developed by a group of universities under the aegis of the Southern African Regional Universities Association (SARUA 2017). Universities could also run continuing education programmes to update practising professionals in, for example, engineering, architecture and agriculture, on the latest findings on the effect of their work on sustainable development.

Eventually, sustainable development challenges will also lead to completely new graduate programmes addressing specific aspects of sustainable development. Introducing new programmes and amending the curricula are crucial but not sufficient. Addressing most of the development challenges in Africa requires a multi-disciplinary approach to teaching and learning. There is therefore a need to adopt a multi- or inter- or even intra-disciplinary approach in the running of higher education

programmes. This can prove to be quite challenging as the disciplinary silo-effect is well-entrenched in universities and academics prefer teaching and researching in their specialised areas.

A new pedagogical approach to teaching and learning is equally important. Students should be encouraged to learn rather than be taught and problem-based learning can promote generic skills such as team work, critical thinking and creativity. The lack of academic staff and reluctance among current staff to adopt rather different approaches to learning, however, can prove to be a constraint.

22.4 Internationalisation of Africa Higher Education

Achieving the SDGs requires graduates who have an understanding of global challenges, who have the skills to connect, communicate and cooperate with peers and partners around the world and thus are able to tap from and contribute to global and regional knowledge networks. HEIs need to educate students in the knowledge, skills and attitudes to enable this. That is the reason why internationalisation of higher education is vitally important.

While internationalisation is not new to Africa's higher education, it has impacted on the sector in unprecedented ways especially in recent years (Sehoole and Knight 2010). Study abroad experiences of both African students and staff, internationalisation of the content of study programmes, internationalisation of the training of researchers (notably of Ph.D. studies), using latest IT technology in international cooperation and developing quality assurance mechanisms to international standards are all ways in which internationalisation positively affects African higher education. Internationalisation though has manifested itself in different ways leading to different outcomes. The main manifestations of internationalisation in Africa have been an increased mobility of students from Africa to other world regions, more intra-African mobility of students, enhanced partnerships between African universities and universities in other parts of the world and transformations in university management, amongst others (Jowi and Mbwette 2017).

Achieving the SDGs will be greatly enhanced by further internationalising African higher education. An updated internationalisation agenda for African higher education needs to entail the internationalising of the content of study programmes to achieve a state-of-the art level to international standards—or even better. It will include educating students (and staff) the skills and attitudes required to work in a globally connected world and facilitating study abroad experiences of both African students and staff. It also comprises the internationalisation of the training of researchers (such as Ph.D. students). Last but not least it will entail the enhancement of international partnerships that address the SDGs, including regional partnerships (as for instance based in Eastern, Southern or West Africa) that are addressing aspects of sustainable development.

Internationalisation and university partnerships are very crucial in the attainment of the SDGs and for African participation in wider global developments. DG 17 that focuses on partnerships also implies higher education. Universities provide one of the best platforms for developing partnerships that could enable the attainment of the SDGs. Institutional partnerships are an important aspect of internationalisation of higher education (Sehoole and Knight 2010). Through educational cooperation, collaborative research in different fields, capacity building for knowledge generation and utilisation, developing a new generation of African scholars, researchers and practitioners, African universities would have a meaningful contribution towards the attainment of the SDGs.

22.5 International and Regional Cooperation

The cardinal role of African universities in the attainment of the SDGs coupled with the challenges that these institutions face call for concerted efforts by development partners and HEIs

in other parts of the world to work with African universities. International funding agencies with a focus on higher education and research tend to direct their support to African universities on their role in achieving the SDGs. This becomes also evident in bilateral engagements on the higher education sector between Africa and other world regions. Within regional blocs in Africa, there has been growing emphasis on support for governmental and inter-university collaborations, for instance in the East African Community (EAC) and the Southern Africa Development Community (SADC). Regionalisation has thus also emerged as a new development in African higher education that could enhance the capacity of African universities to address the SDGs. Several regional higher education initiatives have been identified including regional university associations, regional networks and regionally embedded centres of excellence (Jowi and Mbwette 2017; Mohamedbhai 2015). Most of them pursue targeted and priority areas related to the SDGs. In the past few years several regional centres of excellence have been developed to strengthen and develop expertise and research capacities in different fields. Mobility schemes for both students and staff have also developed alongside these centres.

Despite these positive developments, several studies have highlighted the many challenges that internationalisation pose to higher education in Africa and could thus also impact negatively on the capacity of these institutions to address the SDGs. These include brain drain, commercialisation of higher education, adoption of unsuitable curricula, unhealthy competition especially as a result of university rankings and certain impacts on institutional cultures and practices (Teferra and Knight 2008). Others have shown the positive effects of African diaspora active in higher education and research who contribute to development in their countries of origin (Docquier 2006).

To benefit more from internationalisation and utilise it effectively in response to the SDGs, African universities have to address unintended consequences of internationalisation. This will also require joint efforts with universities from other parts of the world, development partners and African governments. African universities must work with these stakeholders to review their curricula, strengthen the quality of programmes and institutional governance to enable them maximally utilise the benefits of internationalisation to address the SDGs. African universities might have missed the step with the Millennium Development Goals (Shabani and Okebukola 2017), they must now use these possibilities of internationalisation, amongst others, if they have to meaningfully respond to the SDGs. As Ebrima Sall, then CODESRIA Executive Secretary remarked during a conference of the African Network for Internationalisation of Education (ANIE) on the same theme, “African universities must run where others walked”.

22.6 Knowledge Development

Massive investments in knowledge development by African Universities are required to implement the SDGs. In their search for endogenous solutions towards achieving the SDGs African researchers must be able to tap from global knowledge networks (Aarts and Greijn 2010). They have to be able to “scan globally” and “reinvent locally” (Stiglitz 1999). At the same time, by developing knowledge addressing African challenges African universities have a lot to contribute to global knowledge networks.

Knowledge gaps that need to be addressed concern understanding the challenges, developing solutions and monitoring the effectiveness of SDG oriented interventions. This section discusses three factors that influence the effectiveness of African HEIs in their endeavours to develop knowledge in support of the SDGs: capacity, focus and regional synergy of research efforts.

22.6.1 Capacity

Capacity refers in this context to the total of research efforts that is invested in addressing the knowledge questions related to the SDGs and the quality of these efforts. The capacity depends to a large extent on the amount of research funds, the number of researchers available to conduct research and the quality of these researchers. Statistics in the United Nations Educational, Scientific and Cultural Organization Science report of 2015 indicate that African investments in research and development are still very limited. Gross domestic expenditure on R&D (GERD) in Africa amounts to US$ 19.9 billion (purchasing power parities) in 2013, which represents 1.3% of the world's GERD. GERD spending in Africa amounts to 0.45% of the GDP compared to 1.7% in the world. Per capita GERD in Africa amounts to US$ 17.9 compared to US$ 206.3 in the world. In Africa there are 168.8 researchers per 1 million inhabitants, compared to 1083.3 in the world and 3814.1 in high-income countries.

These figures show that the research capacity in Africa is limited. This implies that investments in research need to be increased almost by a factor of four in order to reach the world average of GERD spending as a percentage of the GDP. Such an increase is unlikely to happen in the short or medium term. Therefore, more than in most other regions of the world, African countries need to maximise the efficiency with which limited resources for R&D are transformed into relevant knowledge needed for achieving the SDGs, and the uptake of this knowledge by decision makers. This can be achieved through enhanced focus and regional synergy.

22.6.2 Focus

Though a focus on knowledge development for national, regional or global development goals is a stated priority for most African HEIs, this is not always actual practice. Obamba et al (2013) explain how Kenyan universities have gradually transformed from institutions that provide higher education for manpower development, to institutions that support knowledge-based development planning. The alignment of knowledge development by universities with national development priorities is reflected in the changing discourse in strategic plans and policy papers of the university and in national strategy papers such as Vision 2030 in Kenya. Possibly more focus can be achieved through setting national and institutional research agendas that clearly identify the knowledge questions that need to be addressed most urgently with a view to achieving the SDGs. Research agendas would constitute important reference points for researchers in formulating relevant research questions. They can also be helpful in achieving collaboration and synergy among researchers and between researchers and stakeholders that can apply the knowledge developed.

A research agenda can help to increase the likelihood that research, even if it is externally funded, is focused on African priority setting and that research leads to the knowledge uptake by decision makers, who have been involved in the process of setting the agenda. This is particularly important in the African context in which a substantive part of research is funded from external sources. This includes African researchers who are involved in international research partnerships funded by external research programmes. It also includes research that is conducted by post-graduates that, supported with foreign scholarships, pursue a Ph.D. abroad, often outside Africa. In both cases there is a risk that foreign academics (Ph.D. supervisors or foreign research partners) dominate the process of formulating research questions, resulting in research that is not co-owned by decision makers or may not reflect domestic SDG priorities. It needs to be emphasised that there are good examples of international partnerships that do address national priorities in the framework of global development goals.

Obamba et al (2013) describe two exemplary cases in which international and African partners collaborate on a basis of equity. These are the partnership between Moi University and Flemish

Inter-University Council (VLIR) (2007–2017) with the involvement of five universities in Belgium, and the AMPATH programmes which cover collaboration between Kenyan and US Universities. Both partnerships cover a broad spectrum of knowledge domains. On the other hand, there are also examples where there was no equity, with the roles African researchers being limited to data collection and laboratory work. Chances are slim that such partnerships are effective in mobilising the research findings for influencing policy and achieving knowledge uptake by decision makers.

African HEIs can and should take the lead in developing national and institutional research priority setting. With regard to national research agendas, lessons can be learned from experiences with priority setting for health research in Africa and other developing countries (COHREDI 2000). To enhance the likelihood that the research agenda will be implemented it is important that a broad spectrum of stakeholders participates, not only the academia. The priority setting needs to be done on the best available information and important information gaps have to be filled. The criteria for priority setting should be developed before the identification of priority problems areas. Furthermore, the process has to be transparent and the conclusions should be shared widely.

Complementary to African HEIs taking the lead in developing research agendas, foreign research funding agencies have a responsibility in giving priority to research projects that are informed by, and contribute to African research agendas. Besides academic excellence, selection criteria used to assess proposals for research should include evidence that the research questions are focused on the SDGs and relevance to Africa and that African stakeholders—including African HEIs—have been involved in formulating the proposal. Furthermore, there should be sufficient indication that the partnership is genuine and based on equity and includes actors with the leverage and position to achieve knowledge uptake by decision makers.

The last point is especially crucial. Evidence generated in the framework of the Research and Policy in Development (RAPID) programme of the Overseas Development Institute shows that creating strong partnerships that bring together policy-makers, practitioners and researchers is a prerequisite for knowledge uptake. This suggests that the likelihood of knowledge uptake by decision makers can be enhanced by ensuring that in the preparation of the calls for proposals, prospective applicants have ample opportunity to engage in a genuine dialogue with potential partners about the "why" of the partnership (the research question, the relevance of the research questions for policy and practice, consultations with stakeholders) before engaging in a discussion about the "how" (the research methods).

22.6.3 Regional Synergy

Because most African countries face similar development challenges that require similar approaches for analysing the sustainability challenges, finding solutions and monitoring performance, African HEIs can increase their effectiveness through regional cooperation. Regional synergy considers the extent to which African researchers can coordinate their research efforts and build on each other's research achievements. Synergy in research conducted in the various African HEIs can be achieved through networking and regional partnerships.

National Research and Education Networks (NRENs) that interconnect universities and research institutions nationally, regionally and globally, can provide a tremendous boost to research productivity. However, currently only nine African countries have established high quality sustainable National Research and Education Networks: Algeria, Egypt, Kenya, Morocco, Senegal, Tunisia, South Africa, Uganda and Zambia.[1]

Advances in IT have greatly facilitated networking among institutions but there is still a lot to be done. Having the IT infrastructure in place is not sufficient for regional partnerships and

[1] http://www.universityworldnews.com/article.php?story=20161214142445787 (issue of 16 December 2016).

networking. Obamba et al. observed that in the case of Moi university the research partnerships were mainly with universities from scientifically advanced countries and with only a few national actors. The emergence of regional centres of excellence (CoEs) is extremely important with a view to complement international partnerships with regional research collaboration. Examples of research centres that have been in existence for some time are the International Institute of Insect Physiology and Ecology (ICIPE) based in Kenya, the African Laser Centre (ALC) and The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). Since the African Ministerial Conference on Science and Technology (AMCOST) initiated the idea of CoEs a large number of networks have sprung up (Mohamedbhai 2015).

22.6.4 Community Outreach

Africa has some of the poorest countries in the world and the highest level of poverty appears in the rural areas, where the majority of the population lives. More than any other world region, it is in Africa that universities can effectively use community outreach to contribute to several of the SDGs in the rural areas. The good news is that African universities are reasonably active on this front. In the GUNI-IAU-AAU (2011) survey, two-thirds of the responding institutions mentioned that they were engaging with the rural community in a number of ways. Even more encouraging is that half of the respondents mentioned that they were engaged in activities related to peace, security and conflict resolution (SDG16), vital for Africa's sustainable development.

Students are perhaps the greatest asset of a university, but which is not always fully tapped, for promoting rural development through community engagement. The posting of students in rural areas for practical training during their courses not only provides them an opportunity to assist the rural community, but also exposes them to rural challenges and helps bring problems to the university for possible solutions through projects. This is particularly relevant for students studying agriculture, architecture, engineering and health and medical sciences (Mohamedbhai 2008). The University of Cheikh Anta Diop in Dakar, Senegal used to run a vacation camp that would annually transport some 500 students in various disciplines to various rural communities where they would participate in reforestation activities, educate illiterate women and provide medical consultations. The programme, which was donor-funded, was highly successful but unfortunately was abandoned when the funding stopped.

As the majority of universities in Africa are located in urban areas, many of them have created institutes or centres for rural development to facilitate their outreach to the rural areas. The Institute for Rural Development of the University of Venda (UNIVEN) in South Africa is one such example. It is a flagship unit of the university and one of its key mandates is 'mobilising staff, students, rural communities and other stakeholders for collective action against poverty and underdevelopment' (UNIVEN 2017).

Several African countries have purposely set up universities in rural areas, not only to facilitate access to rural students but also to ensure closer linkages between universities and the rural community. An outstanding example is the University of Development Studies (UDS) (UDS 2017) located in northern Ghana, which is the poorest part of the country. Its vision is pro-poor aimed at addressing the conditions and structural causes of poverty. A unique feature of UDS is its third Trimester Field Practical Programme, which is an integral part of the curriculum of all its programmes and during which staff and students work closely with disadvantaged rural communities with a focus on poverty reduction.

Another example is the African Rural University, an all-women university located in the highly rural mid-western Uganda. Its objectives include enhancing indigenous models of development, empowering the rural poor and eliminating the urban bias of university education in Uganda. All students follow three years of theory and practice at the university, followed by one year of field internship before graduation.

The graduates are given opportunities for employment in satellite rural development centres.

22.7 Conclusion

African HEIs have a significant role to play in achieving the SDGs in Africa. The chapter highlighted that HEIs can contribute to SDGs in Africa in five main ways. First, by increasing enrolment in HE to create human capacity required for attainment of the SDGs. Second, SDGs should form part of all curricula in HEIs in order to expose students to challenges of sustainable development. The adoption of new learning approaches may greatly enhance the ways in which students and staff learn about these challenges and how to address these, and this learning needs to entail not only knowledge but also skills, attitudes and global citizenship. Third, as SDGs require the connectedness among researchers, students, governments and policy-makers at various levels and in different parts of the world, HEIs face the challenge to prepare their students and staff for such worldwide connectivity through internationalisation of their educational and research programmes. As the chapter has shown, existing economic regions in Africa offer a useful platform on which African HEIs could be connected. The increase in the number of regional centres of excellence is evidence that this is already happening to some extent. Fourth, African HEIs have a crucial role to play in developing knowledge through research and application of new knowledge. Fifth, African HEIs are well placed to promote community outreach not least because they are located in a continent with acute development challenges.

There is, potentially, a unique role for African universities in achieving the SDGs. Africa is, and will be for decades to come, in terms of its population, the youngest continent. Ever more young Africans, in relative terms and certainly in absolute numbers, will need to complete tertiary education. Most of these new generations of Africans will have to be educated in Africa. It is these African children who will have to shape a sustainable developed Africa—and it is this sustainable Africa that will be crucial in achieving the global sustainable development goals—not just in Africa but globally as well. Hence, SDGs should be at the core of teaching, research and community outreach in African universities and other HEIs. Though African HEIs face constraints and practical challenges on the ground, notably in terms of scarcity of both human and material resources and funding which puts limitations on what can be done, it is a matter of vision and direction whether HEIs will transform themselves sufficiently in this direction. If they succeed, this will boost the societal relevance of African HEIs on a local, regional and even global level.

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23 Which Factors Influence International Research Collaboration in Africa?

Hugo Confraria, Jaco Blanckenberg and Charl Swart

Abstract

It is commonly accepted that international research collaboration improves scientists' abilities and performance. In this chapter, we investigate the question: what are the characteristics of African researchers who collaborate more often with international partners?. Data are taken from Web of Science and a survey that collected detailed information about the individual characteristics of 2954 African researchers in 42 African countries. We use descriptive statistics and an econometric model to discern the characteristics that are associated with higher levels of collaboration with researchers outside Africa. Overall, our results suggest that, on average, researchers who did their doctoral studies outside of Africa, had the opportunity to move abroad (over the past 3 years) and received a higher share of international funding (over the past 3 years), are more likely to collaborate more frequently with researchers outside of Africa. In our conclusions, we discuss that beyond increasing the availability of mobility scholarships and the amount of research funding for African scientists, policymakers and international organisations should also think in incentives to keep long-term research interactions and try to avoid unequal partnerships.

Keywords

Research collaboration · African science · Scientific capabilities · Research policy

23.1 Introduction

The Sustainable Development Goals (SDGs) encompass the interlinkages of the three dimensions of economic growth, social development and environmental sustainability. In Africa, critical to all these dimensions is the development of skills and capabilities that allow human development and structural transformation of the 54 economies to productive structures based on industrial development and modern services (Gaye et al. 2015).

In order to achieve SDG 4 (Quality education) and 9 (Industry, innovation and infrastructure), it was stated that it is specifically important to enhance the scientific and technological capabilities of low- and middle-income countries. One of

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the known mechanisms to improve those capabilities is by increasing the intensity of research collaboration with other international partners. The benefits of international collaboration are widely acknowledged and include access to expertise, complementary know-how and new techniques, generation of learning opportunities, improving networking activities, better access to funding and equipment, national and international recognition (Katz and Martin 1997; Beaver 2001; Wagner et al. 2001; Bozeman and Corley 2004; AOSTI 2014; Arvanitis and Gaillard 2014). These benefits are also recognised in SDG 17 (Partnerships for the goals), where an important target is to 'Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation, and enhance knowledge sharing on mutually agreed terms (…)'. Yet, despite a long history of cross-border cooperation between researchers worldwide, there are few empirical studies on the main drivers of international research collaboration in lower income regions.

This raises the questions of why some researchers collaborate more often with international partners than others; and second, what form should collaborative research take to overcome the pitfalls associated with the North–South divide? We will address these issues by studying the characteristics of African researchers who collaborate both frequently and infrequently with non-African researchers. This will be achieved by relying on survey data, bibliometric data and employing ordered probit regression analysis.

Most of the previous research that analyses the intensity of international research collaboration of specific authors relies on the use of co-authorship of scientific publications from different countries. However, co-authorship is seen as a partial indicator of collaboration since scientific collaboration may happen without resulting in a co-authored paper (Katz and Martin 1997; Laudel 2002). In our work, we will use a subjective measure of collaboration that was captured by a large survey sent to all African researchers who (co-) authored an article in WoS (Web of Science) and Scopus between 2005 and 2015. The questionnaire included items that asked respondents how often (1–5 Likert scale) they collaborate, either in joint research or through joint publications, with researchers at their own institution, other institutions in their own country, institutions in other African countries and institutions outside of Africa. The last item of this question will be employed as the dependent variable to assess the collaboration intensity outside of Africa of individual researchers.

In our study, we are particularly interested in investigating whether doing the highest qualification (Ph.D.) outside Africa, recent mobility and receiving a higher share of research funding from outside Africa allows African researchers to collaborate more frequently outside Africa. The richness of the data allows us to control for a large number of characteristics including academic age, scientific productivity (number of publications per academic age), challenges faced (lack of mobility opportunities, lack of research funding and lack of mentoring), gender, region and subject area.

23.2 Background

The total research output from researchers in Africa is a small proportion of global science. It is highly skewed across nations and disciplinary areas, and most countries rely heavily on international funding and international collaboration to sustain their research systems (AOSTI 2014; Confraria and Godinho 2015). Therefore, the notion of 'African science' may be misleading, as previously suggested by Tijssen (2007).

The importance of international collaboration and the legacy of colonial ties are recognised as playing a pivotal role in Africa's scientific output. Bibliometric studies usually find little scientific co-authorship between African countries with preference being given to collaboration with higher income nations (Narváez-Berthelemot et al. 2002; Onyancha and Maluleka 2011; Mêgnigbêto 2013; Guns and Wang 2017). When

African countries do collaborate with one another, frequently those collaborations have been initiated by a non-African country (Boshoff 2009; Toivanen and Ponomariov 2011) or mediated through cooperative health and agricultural programmes (Adams et al. 2013). Also, it has been suggested that African researchers are rarely leading authors in international publications and that their role is often still primarily limited to collecting data and linking up with domestic policy debates (Boshoff 2009; Carbonnier and Kontinen 2014).

Yet, from a policy perspective, international collaborations are seen as one of the most efficient means to build research capacity and to create learning opportunities for African researchers (AOSTI 2014). With the limited resources that most African universities have, building international collaborations can allow individual researchers to access infrastructures and scientific networks, which they would not have access to when working in isolation. Therefore, governments and international organisations allocate substantial resources to promote international research.

Several policies can be endorsed to improve links between national researchers and researchers in other countries. Some examples include expanding the number of scholarships that allow Ph.D. students and researchers to go abroad to interact with peers; increasing the amount of research funding provided by governments and international organisations to research projects in African countries, and attracting foreign scholars to work and do research in African institutions. For example, target 4b of the SDG committed the 193 signatories to the agreement to 'substantially expand globally the number of scholarships available to developing countries'. In this chapter, the question of which set of policies could contribute to improving international research collaboration is one of our driving questions. By investigating the characteristics of researchers who collaborate more often outside of Africa, we aim to contribute to the nuanced policy discussion surrounding this issue.

23.3 The Main Characteristics of Internationally Collaborating Researchers

One consistent finding in studies focusing on the factors that affect international collaboration is mobility. The networking power of doing a Ph.D., postdoc, visiting or going to conferences abroad are particularly important in initiating long-lasting scientific collaborations (Jonkers and Tijssen 2008; Arvanitis and Gaillard 2014; Marmolejo-Leyva et al. 2015; Scellato et al. 2015). In our study, we will measure mobility in three dimensions: (1) Obtaining the highest qualification in a non-African country; (2) having studied or worked abroad in the past three years; and (3) perceiving that lack of mobility opportunities impacted negatively their career to a large extent.

While mobility is the main concern, another important dimension is the availability and source of research funding. Existing research indicates that international collaboration increases in the long run in consequence of the use of funding schemes that encourage cross-country collaboration (Defazio et al. 2009) and foreign funding increases the number of South–North collaborations (Zdravkovic et al. 2016). Our survey included three questions about funding: (1) Being or not a primary recipient of research funding in the last 3 years; (2) the share of international funding received in the last 3 years (primary recipient or not); and (3) perceiving that lack of research funding impacted negatively their career to a large extent. We will use these three variables to examine how research funding can impact higher levels of international collaboration.

Finally, individual characteristics of the researcher may also play a role. Across all areas of research, older researchers tend to have more collaborators (Wang et al. 2017), more productive scientists tend to cooperate more (Lee and Bozeman 2005); and males tend to collaborate more often with researchers abroad (Abramo et al. 2013). At the same time, scholars agree that

mentoring can be associated with a wide range of positive outcomes such as productive research careers, motivational benefits, better preparation in making career decisions and increased network opportunities (Allen et al. 2004; Evans et al. 2008). Therefore, in our analysis, we will also include as independent variables academic age (2017—year of first publication in WoS), scientific productivity (number of publications in WoS/academic age), gender and perceiving that lack of mentoring was a challenge that they faced during their career.

Due to the structure of our data, we cannot claim a causal relationship between these features and collaboration intensity with researchers outside Africa. We do not have longitudinal data and thus cannot observe the changing patterns over time. Nevertheless, we take a first step in analysing what characteristics are associated with researchers who collaborate internationally.

23.4 Data and Methodology

This chapter combines survey with bibliometric data. Survey data were collected via a self-administered, web-based, structured questionnaire sent to all researchers with an African affiliation that were authors of publications in Web of Science or Scopus between 2005 and 2015.[1] It was adapted from the questionnaire used for the Global State of Young Scientists precursor study (GLOSYS) (Friesenhahn and Beaudry 2014) and for GLOSYS in ASEAN (Geffers et al. 2017). The questionnaire is divided into 10 sections: educational background, employment, working conditions, research output, funding, career challenges, international mobility, collaboration, mentoring and demographic characteristics, and contains a total of 36 items. It was initially developed in English and then translated into French in order to increase the probability of receiving responses from countries that have French as a primary language. The survey was administered between May 2016 and February 2017. The questionnaire response rate was an acceptable (10%), with 7513 respondents.

Some of the researchers who completed the questionnaire do not have a fixed residence in Africa or may not have a nationality from an African country. Any researcher who published one article with an African affiliation between 2005–2015 may have completed the form. In our analysis, we exclude authors who reported that their residence and nationality is not in/from an African country. We made this decision because the conditions and settings of researchers with an African affiliation who were not based in an African country, or were not born in an African country, may be very different from our population of interest.

Our analysis also excluded researchers who reported that they belong to Humanities-related fields due to the limitations of bibliometric indicators in this area (Hicks et al. 2015; Marx and Bornmann 2014). Finally, researchers who didn't answer all our questions of interest were also removed from the final sample. After applying these restrictions, 2954 researchers compose our final sample. Despite the high number of responses, the survey observations, based on an uncontrolled sample, cannot be considered as representative of the targeted population.[2] However, the characteristics of the sample show a fair representation among regions, subject areas and gender. Furthermore, several robustness checks were done in order to assess the validity of our model and results.

The source of bibliometric data is WoS. All articles and reviews from researchers with an African affiliation, published between 1980 and 2016, were extracted. After collecting our sample of articles with an author with an African affiliation we extracted the email addresses, names and affiliations of all African authors involved and we matched that info with the info of the authors that completed our survey.

[1]Only authors that reported their email address in Web of Science or Scopus were contacted.

[2]All African researchers who have a publication in WoS or Scopus between 2005 and 2015.

23.4.1 Approach

Our analytical section is composed of two segments. In the first section, we use descriptive statistics to examine trends in African scientific production and to study our sample of researchers. In the second part, we will use an ordered probit model, an econometric tool that allows us to discern the characteristics that are associated with higher levels of collaboration with researchers outside Africa.

The ordered probit model involves a qualitative-dependent variable for which the categories have a natural order that reflects the magnitude of some underlying continuous variable (Greene 2012). In our case, the dependent variable is expressed in terms of five categories (1—Never, 2—Rarely, 3—Sometimes, 4—Often, 5—Very often) which could be viewed as resulting from a continuous variable called 'collaboration intensity'. All the other characteristics are treated as independent variables that can potentially affect collaboration intensity. The starting point is an index model, with single latent variable:

$$y^* = x'\beta + \varepsilon$$

where x are a set of characteristics of each researcher, which in our case are: (1) location of highest qualification (African or non-African); (2) having studied or worked abroad during the last three years; (3) being a primary recipient of research funding over the past three years; (4) share of international funding received over the past three years; (5) perceiving that lack of mentorship, mobility and funding was a factor that affected negatively their career to a large extent. To avoid omitted variable bias, controls will be added for individual characteristics such as academic age, scientific productivity, gender, subject area and African region. In the model ε is disturbance and y^* is unobserved.

23.4.2 Results

The scientific output in Africa has increased considerably during the last decade. In Fig. 23.1, we can observe that the total world share of articles and reviews in Africa increased from 1.4% in 1990 to 2.7% in 2016. However, as shown in Fig. 23.1, since 2006 this increase has been mainly driven by international collaborations (publications that have at least one foreign author).

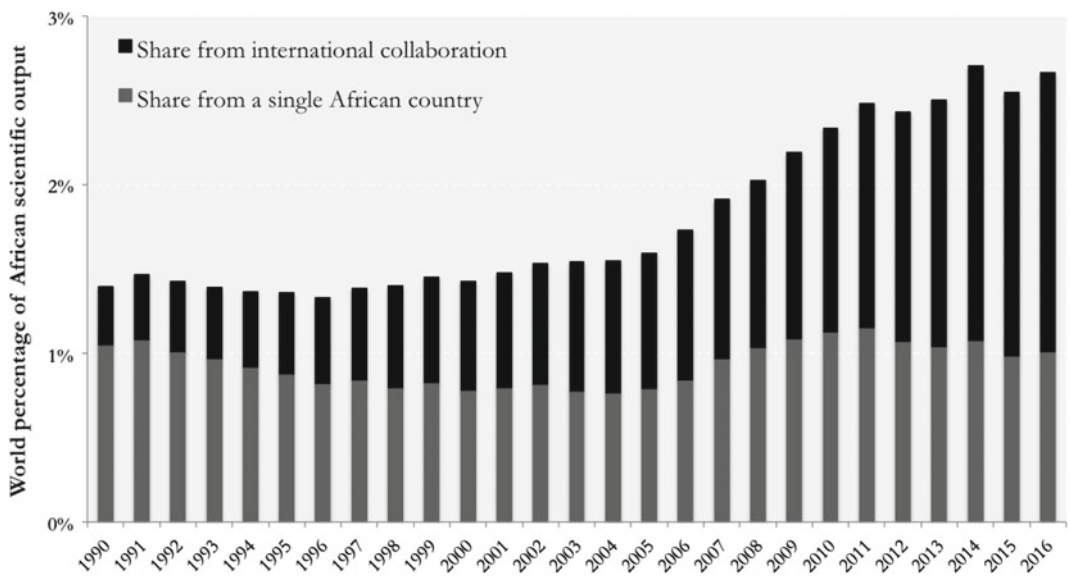

Fig. 23.1 Trends in the share of international scientific collaboration in Africa (Own elaboration and WoS)

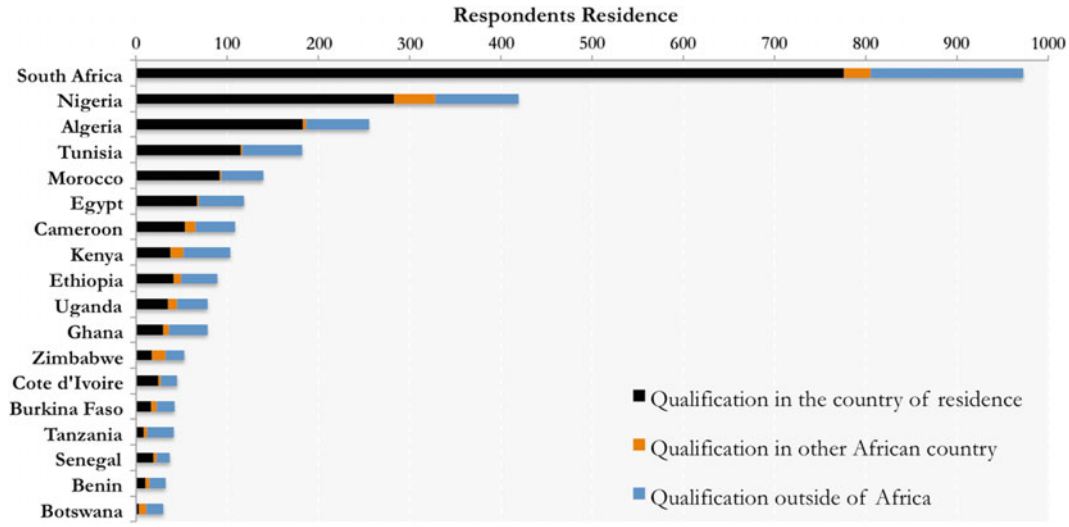

Fig. 23.2 Number of researchers resident in an African country (by location of highest qualification) (Own elaboration). *Note* We only included in this graph African countries that have at least 30 responses

This finding demonstrates the importance of international collaboration for African scientific output and motivates our research question to a certain extent.

Our survey respondents comprise a fraction of the total number of African researchers. Around 81% have a Ph.D. and 92% reside in the country of their nationality.[3] In Fig. 23.2, we can observe that, geographically, 32.4% (973) of the African researchers in our sample are based in South Africa. The other three countries with the most respondents are Nigeria (14%), Algeria (8.7%) and Tunisia (6.2%). At the same time, South Africa is the country with the smallest percentage of researchers who did their highest qualification outside of Africa (17.2%). On the other end, Tanzania (71.4%), Botswana (63.3%), Ghana (53.8%) and Benin (50%) are the countries with highest level of researchers with a non-African highest qualification. These findings surely raise the need for infrastructural development in those countries highly dependent on foreign institutions to train their researchers.

The share of researchers with a qualification in an African country different from their country of residence is relatively small. Northern African countries have very few of those researchers and the country with most researchers who completed their highest qualification in a different African country is Nigeria (45). These results mirror the predominance of the South African research system within Africa. Besides having much more researchers than the other African countries, they produce a bigger share from their own system.

We have reasons to believe that researchers from Egypt are underrepresented in this sample. According to UNESCO (2015), Egypt accounts for more than 20% of the total number of publications with an African author in a similar period of analysis. In our sample, they are only 4% of the researchers (116). Researchers based in Egypt may have had a more difficult time receiving emails that include surveys or links to surveys. A number of respondents commented that emails of such a nature are blocked by mail servers and firewalls.[4] In our research, we will assume that the

[3]We are not counting African researchers who work in a non-African country.

[4]Furthermore, some respondents mentioned the general suppression of academic freedom and access to information. However, these statements are based on specific comments from only a number of respondents.

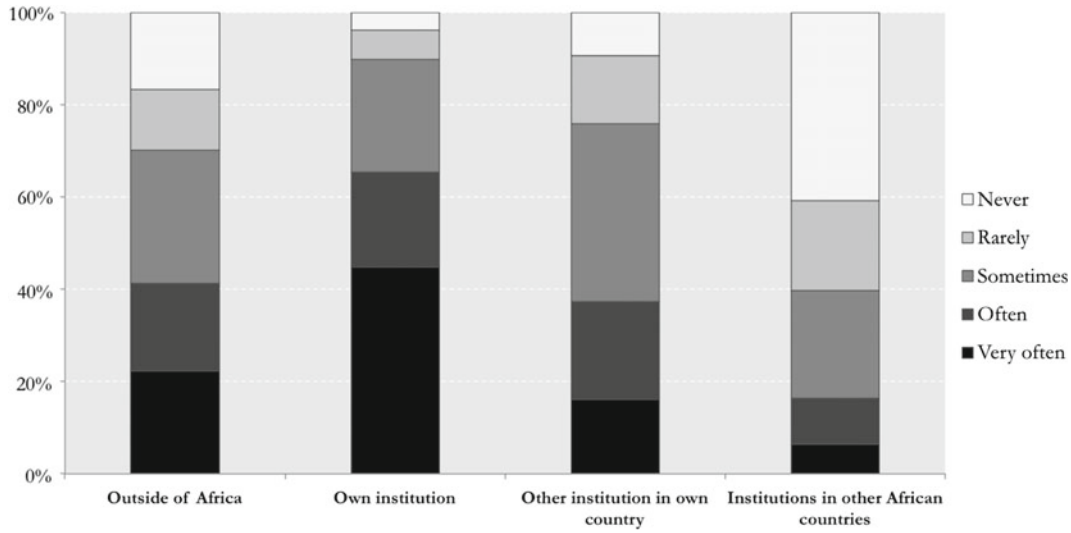

Fig. 23.3 Intensity of collaboration with four types of collaborators (Own elaboration)

characteristics of Egyptian researchers are similar to the characteristics of researchers in Northern Africa, and in our econometric model we will control for African regions.

Our main research question is focussed on studying the characteristics of the African researchers who engaged in collaborations with researchers outside of Africa. Therefore, it is important to examine in Fig. 23.3 what is the percentage of researchers who collaborate 'very often', 'often', 'sometimes', 'rarely' and 'never' with researchers from outside of Africa, own institution, other institutions in own country and institutions in other African countries.

Not surprisingly, on average researchers collaborate most often with researchers from their own institution. Interestingly, it seems that on average the collaboration patterns of African researchers with researchers outside of Africa and other institutions in own country is very similar. And as expected, researchers in Africa collaborate more often on average with academics outside of Africa than with researchers from their own continent.

We also asked respondents about field of highest qualification and gender (see Fig. 23.4a). The area with more researchers in our sample is natural sciences (32%) followed by medical and health sciences (26%), social sciences (17%), agricultural sciences (13%) and engineering and technology (12%). About 30% of the researchers are female, with the percentage of females relatively higher for the subject areas social sciences (39%) and medical and health sciences (37%), and smaller for engineering and technology (18%). Since collaboration patterns may be different between subject areas and gender, in our regression analysis we will control for both dimensions.

Respondents also reported on the major challenges that have impacted negatively on their careers. On average, the biggest challenge is lack of funding, and the challenge that they reported as least relevant is political instability (see Fig. 23.4b). More than 20% of the respondents also reported that lack of training opportunities to develop professional skills, lack of mobility opportunities and lack of mentoring and support have negatively impacted their career to a large extent. In our econometric analysis, we will generate three dummy variables that are one for researchers who reported that mentoring,

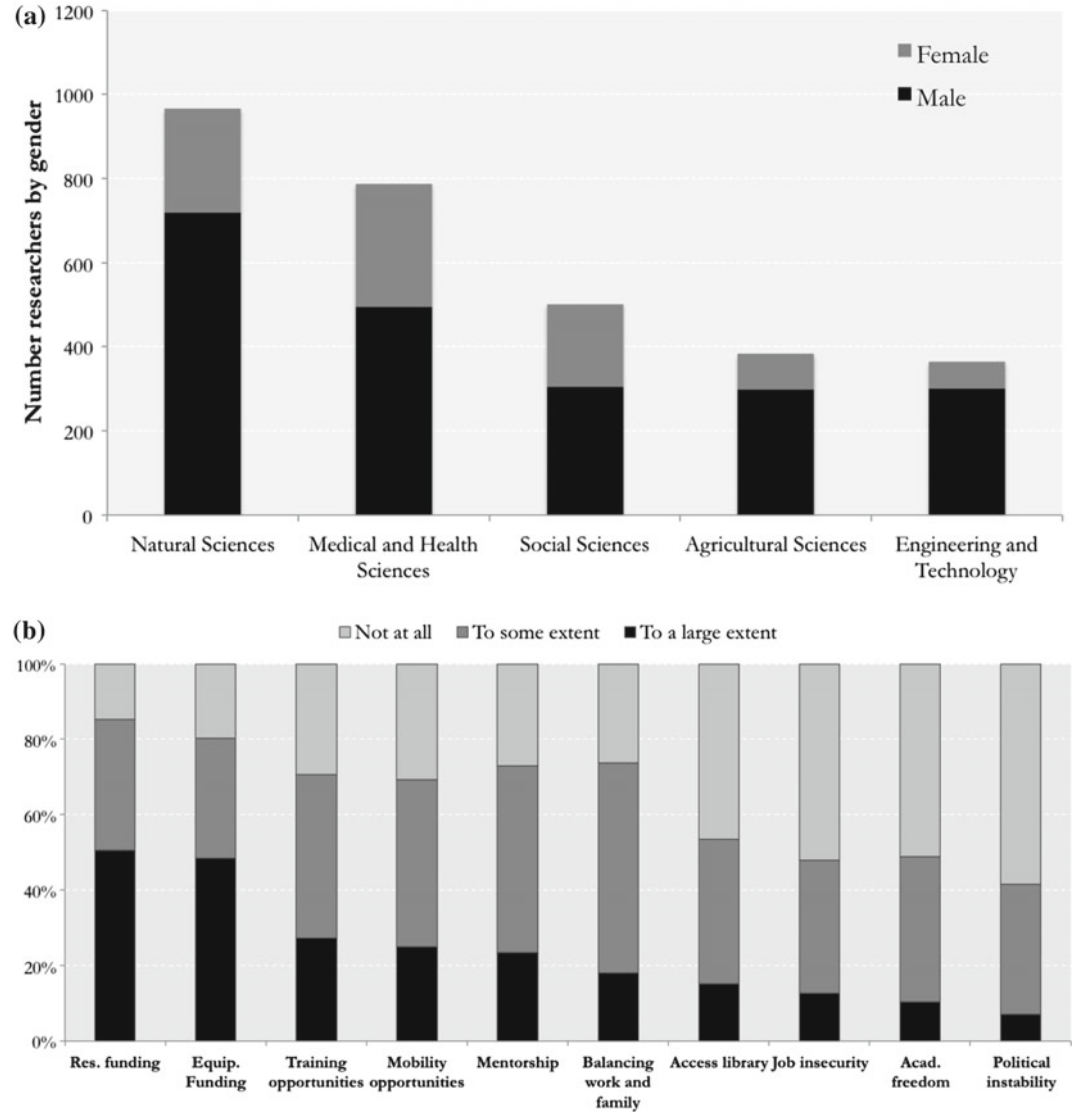

Fig. 23.4 **a** Number of researchers by area and gender (Own elaboration) *Note* Humanities-related fields were excluded due to the limitations of bibliometric indicators in this area. **b** Challenges faced during the career (Own elaboration)

mobility opportunities and research funding were a challenge they faced 'to a large extent'.

Finally, we also gathered bibliometric information on respondents' academic age (defined here as 2017—year of first publication in WoS) and scientific productivity (defined here as number of publications in WoS per academic age). The average academic age is 10 years and the average scientific productivity is 1.06 publications.

23.5 Econometric Results

We used Stata™ to compute the multivariate ordinal probit. The regression model controls for scientific productivity, academic age, gender, subject area (5 of the 6 OECD categories): Natural Sciences, Agricultural Sciences, Engineering and Technology, Medical and Health Sciences, and Social Sciences; and also controls for

regions: South Africa, NorthernAfrica[5] and Central Africa.[6]

In Table 23.1, we compute our regression using as dependent variable collaboration intensity outside of Africa. Model specification I is the original regression and model specifications II and III include interaction terms.

The first of our results indicates that researchers who did their highest qualification outside of Africa are more likely to be in a higher category of collaboration intensity outside Africa. A possible explanation is that African researchers who studied outside of Africa may expand their collaboration network, and upon returning to the continent, still maintained links with their research groups abroad. Our model confirms this hypothesis. A researcher that did his/her highest qualification outside of Africa is 11% more likely to be in the 'very often' category of collaboration outside of Africa, on average, than a researcher that did his/her highest qualification in an African country. However, when we interact with this variable with academic age, the interaction term is negative and significant (II). This means that the connections gained during the Ph.D. may lose importance during a researcher career.

Another variable that is positively and significantly associated with a higher category of collaboration intensity outside of Africa is 'mobility in the last 3 years'. A researcher that has studied or worked abroad in the last three years before the survey is 11% more likely to be in the very often category of collaboration outside of Africa.

Being the primary recipient of research funding and receiving, a higher share of international funding (being or not a primary recipient) are also positively and significantly associated with the likelihood of collaborating with researchers outside of Africa. Indeed, a researcher that receives 100% of their research funds from international sources is 20% more likely to collaborate very often with people outside of Africa than researchers who receive 0% of funds from international sources (on average). This indicates that collaboration often depends on the resource availability provided via international funding.

An interesting result is that different challenges faced during a career of a researcher seem to impact differently the likelihood of collaborating with researchers outside of Africa. For example, a researcher that reported that lack of mentorship was a challenge they faced 'to a large extent' during their career is less likely to be in a higher category of collaboration intensity. A possible explanation is that younger researchers, who usually do not have access to all potential choices for initiating successful and fruitful collaborations, may depend on their mentors/supervisors to establish new collaborations. If their mentors/supervisors do not have access to an extensive research network or do not have the networking skills needed to introduce their students to other researchers, the young researchers may be penalised in the future. We are aware that a chronic problem in some African universities is the lack of qualified human resources for many teaching and training positions and therefore the availability of experienced researchers for supervision and mentoring is limited (Gaillard 2003). Yet, our results seem to indicate that well-targeted pedagogic support may play an important role in expanding a researcher's network.

On the other hand, the positive and significant sign of the coefficient of 'lack of mobility opportunities' indicates that researchers who perceive they had lack of mobility opportunities are more likely to be in a higher category of collaborating intensity with researchers outside of Africa. At first glance, this is not intuitive since greater mobility usually is associated with more collaboration. However, this relation may happen because only the researchers who move frequently perceive that they have less mobility opportunities than their peers around the world. To test this hypothesis, we interacted the dummy variable 'lack of mobility opportunities' with the dummy variable 'mobility in the last three years'. In specification III, we can observe that the

[5]Algeria, Egypt, Libya, Morocco and Tunisia.

[6]All African countries expect South Africa and Northern African countries.

Table 23.1 Ordinal probit regression model (Own calculations)

	COL intensity outside Africa		
Ind. variables	Oprobit I	Oprobit II	Oprobit III
Highest qualification (Ph.D.) outside Africa (1—Yes)	0.41***	0.53***	0.41***
	(0.044)	(0.074)	(0.044)
Mobility abroad in the last 3 years (1—Yes)	0.41***	0.40***	0.39***
	(0.044)	(0.044)	(0.051)
Funding recipient in the last 3 years (1—Yes)	0.14***	0.14***	0.14***
	(0.045)	(0.045)	(0.045)
Share of international funding received in the last 3 years	0.0071***	0.0071***	0.0072***
	(0.00059)	(0.00059)	(0.00059)
Lack of mentorship (1—Yes 'to a large extent')	−0.11**	−0.11**	−0.11**
	(0.048)	(0.048)	(0.048)
Lack of mobility opportunities (1—Yes 'to a large extent')	0.092*	0.093*	0.073
	(0.049)	(0.049)	(0.059)
Lack of research funds (1—Yes 'to a large extent')	−0.043	−0.044	−0.043
	(0.046)	(0.046)	(0.046)
Female (1—Yes)	0.044	0.043	0.043
	(0.046)	(0.046)	(0.046)
Scientific productivity WoS	0.16***	0.16***	0.16***
	(0.021)	(0.021)	(0.021)
Academic age WoS	0.012***	0.016***	0.012***
	(0.0030)	(0.0037)	(0.0030)
Ph.D. abroad × Academic age (Interaction)		−0.011**	
		(0.0054)	
Mobility abroad × Lack of mobility opportunities (Interaction)			0.060
			(0.097)
Constant cut1	−0.33***	−0.29***	−0.33***
	(0.071)	(0.073)	(0.071)
Constant cut2	0.18**	0.21***	0.18**
	(0.071)	(0.073)	(0.071)
Constant cut3	1.05***	1.09***	1.05***
	(0.073)	(0.076)	(0.073)
Constant cut4	1.67***	1.70***	1.66***
	(0.076)	(0.079)	(0.077)
Subject area effects	Yes	Yes	Yes
Regional effects	Yes	Yes	Yes
Observations	2,954	2,954	2,954
Pseudo R2	0.077	0.077	0.077
Wald chi2(16)	619		
Wald chi2(17)		622	619

Note 1 Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note 2 The intercept parameters are significantly different from each other so the five categories should not be combined into one

Note 3 To complement this analysis, we carried out three different robustness checks. We computed an identical model using ordered logit regression; we computed our model using subject area groups, in order to check whether the results are consistent in all areas of knowledge; and we separated our observations in three African regions (South Africa, Northern Africa and Central Africa). In general, the results were consistent with this model

coefficient of 'lack of mobility opportunities' is no longer significant at 10%. This means that indeed the positive and significant coefficient of 'lack of mobility opportunities' in specification I is partially explained by the variable 'mobility in the last three years'. Many of those who didn't move may report they don't have lack of mobility opportunities because they do not care about mobility and don't see it as something important for them.

23.6 Conclusions

This chapter contributes to an understanding of the factors that allow some African researchers to collaborate more often with international partners than others. Data are taken from WoS and a survey that collected detailed information about the individual characteristics of 2954 African researchers in 42 African countries. Our research finds that doing the highest qualification (Ph.D.) in a non-African country, recent international mobility and receiving a higher share of international funding is positively and significantly associated with higher collaboration intensity with researchers outside Africa.

One of the main results is that going abroad to obtain the highest qualification significantly expands your collaboration network outside of Africa. This result supports target 4b of the SDG that aims to increase scholarships available to low- and middle-income countries. Our research also shows that the positive effect on collaboration of doing a Ph.D. abroad diminishes over time. At the same time, researchers who were recently mobile are more collaborative. Ph.D. scholarships should therefore not be limited to the time period of the Ph.D., but should allow for additional travel and visiting opportunities post-Ph.D., to ensure that the networks are maintained or expanded. This could very simply be in the form of a few conference visits or other forms of research visits in the years following Ph.D. graduation. What is important is that the gains that a researcher has received from doing a Ph.D. abroad should not be allowed to wither away so easily with time.

While there is value to foreign training, funders need to consider carefully to which universities they send Ph.D. students, as not all foreign Ph.D. training is equally useful. As argued by Müller et al. (2018) in the South African context, the gains obtained from going to a second-tier foreign university may be smaller than going to a first-tier local university. Furthermore, in this chapter we don't address the dangers of the 'brain drain' or the lack of infrastructure and qualified human resources in many African universities. We are aware that this is a huge problem since some talented Ph.D. students may not return to their home country. Therefore, beyond increasing the number of scholarships for student to go abroad, funders should also continue to develop foundations for research within Africa.

One possibility is for international donors to provide direct funding through research projects. Our work finds empirical evidence that researchers who received a higher share of international funding are collaborating more often with researchers outside of Africa. This was an expected result since several funding agencies, particularly government agencies, mandate cross-country collaboration as part of their funding conditions. However, what we don't explore in this chapter is if a higher share of international research funding increases the number of projects with societal relevance for the local populations and effectively enhances research capacity. In line with SDG goal 17, policies that wish to promote research collaboration should therefore also pay special attention to funding schemes and mechanisms that avoid unequal partnerships (Gaillard 1994; Boshoff 2009).

Several caveats must be kept in mind with regard to our study. First, we use a categorical, self-reported collaboration intensity-dependent variable. This has some disadvantages in terms of the stability of the construct since certain researchers may perceive that they collaborate more often internationally than others, when objectively (e.g. co-authorships) this is not the case. However, in line with Duque et al. (2005), this approach may have certain advantages: (1) it can include collaborations that that did not

involve publication; (2) it might exclude co-authors who achieved that status not by virtue of collaboration but because of influence and hierarchical position.

Besides that, the survey didn't include questions about the motives of collaboration or the dynamics of collaboration seeking. We also have no measures of quality of collaboration and the societal impact of those collaborations. Many researchers in African countries, when they do collaborate internationally, tend to participate in projects that have been conceptualised and designed in the 'Global North' (Boshoff 2009). Who searches for whom and for what? How many frequent collaborators do you have? Future surveys on this topic should probably include such questions.

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24 Making North–South Collaborations Work: Facilitating Natural Product Drug Discovery in Africa

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Abstract

Many global North–South collaborations seek to address different aspects of the Sustainable Development Goals (SDGs) for Africa. The role of the North in these collaborations is crucial from a funding point of view. However, the realisation of the SDG objectives for Africa will depend largely on strategies that are guided by the successes and challenges of previous and existing collaborative efforts. Globally, Africa has the highest disease burden with the leading causes of morbidity and mortality being malaria, tuberculosis, HIV and AIDS and more recently, cardiovascular diseases, diabetes and cancer. Neglected tropical diseases are also causing long-term detrimental health effects, resulting in huge social and economic losses. Ironically, the continent is endowed with a huge biodiversity resource that has the potential to provide novel and potent drug candidates but remains largely unexplored partly due to financial and infrastructural challenges. Developing the scientific research capabilities of African institutions towards drug discovery through global networks is, therefore, an important component of improving health systems on the continent. This chapter examines experiences from three North–South collaborations—the Royal Society's Leverhulme Trust Africa Award (LTAA), Newton Advanced Fellowships (NAF) and Cambridge-Africa Partnership for Research Excellence (CAPREx)—and proposes the adoption of structures that extend the current focus on skill transfer to include the building and maintenance of sustainable infrastructure. It is believed that these thoughts and suggestions could promote sustainable collaborative research to provide

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good health and well-being (SDG3), quality education (SDG4), relevant infrastructure (SDG9) and reduced inequalities (SDG10) in Africa.

Keywords
Drug discovery · Ethical partnerships · Leverhulme · Newton fund · CAPREx

24.1 Introduction

The United Nations' Sustainable Development Goals (SDGs) represent the latest attempt by the international community to address North–South inequalities. Encapsulating 17 goals, covering 169 aspirational targets, the SDGs represent a comprehensive and ambitious programme of development (United Nation 2015). Collaboration between academics and researchers straddling the North–South divide is key in addressing the challenges of the SDGs. In 2015, as part of its commitment to achieving the SDGs, the UN launched its Technology Facilitation Mechanism (TFM) with a view to facilitating 'multi-stakeholder collaboration and partnerships through the sharing of information, experiences, best practices and policy advice among Member States, civil society, the private sector, the scientific community, UN entities and other stakeholders' (United Nations 2012). The goals of the TFM, as outlined above, are both laudable and desirable.

Collaboration and partnership are terms that now form the basis for any serious funding proposal and much ink has been spilled detailing how proposed projects will seek to entail novel ways of ensuring interdisciplinarity, cross-sectionality and symmetrical participatory structures. However, the reality is that despite the increasingly inclusive-sounding language observed in funding proposals, collaborative efforts frequently remain one-sided, top-down affairs, dominated by the needs and requirements of partners from the affluent North. As has been highlighted by critics, much of this type of collaboration is ritualistic, an end, rather than a means to an end (Gaillard 1994; Cooke and Kothari 2001; Binka 2005; Halversen and Nossum 2017). Uncritical acceptance of 'box-ticking' forms of participation and collaboration, instead of subverting existing power structures, serve only to reinforce them by affording research leads a degree of unwarranted and undeserved legitimacy in the eyes of funding bodies. This is problematic for a host of reasons, not least because genuinely participatory and collaborative relationships have been shown, time and again, to produce often genuinely innovative and groundbreaking research (Chibale, Davies-Coleman and Masimirembwa 2012; Flint and Meyer zu Natrup 2014).

It is important, therefore, when considering best practice, that notion of participation and collaboration be adequately interrogated. Accordingly, determining what constitutes 'genuine' participation and collaboration—in this instance with respect to our research experiences in natural product identification for infectious and non-infectious diseases in Africa—constitutes the basis for this chapter. We argue that while collaboration has produced undeniable benefits, the nature of the funding models employed is flawed.

24.2 The Landscape of North–South Academic Collaborations

Although the pattern of North–South collaborations has evolved over time, partnerships to some extent still reflect historical ties. Former colonial powers such as France, the United Kingdom and Belgium blazed the trail by setting up premier universities in their former colonies, promoting research activities first through technical support and later, collaboration. The Anglophone–Francophone divide is visible in the regional spread of these collaborative networks because common administrative structures and official languages facilitate stronger relationships. The US, Canada, Japan, Sweden and Australia, who have no colonial past have become major actors in the

donor community through scholarship programmes and institutional grants (Gaillard 1994).

South–South collaborations are also on the rise. In the last few decades, there has been growing interest from the emerging economic powers—Brazil, China, India and Korea—in partnering with Africa and assisting in its development. Academic collaborations are mainly in the form of provision of scholarship opportunities to African faculty/students to study but ensure that they return home after their training to avoid the problem of brain drain. Brazil is becoming a major partner to Lusophone African universities in this regard (Sawahel 2013). A comparative study focusing on the relevant strengths of North–South versus South–South academic engagements should provide rich grounds for future study.

24.3 Structure of North–South Academic Collaborations in Practice

Based on our experiences in North–South collaborations involving natural product identification towards the discovery of new drug entities, it is obvious that the structuring of most collaborative bids is shaped—to a large extent—by the research priorities of the host funding bodies, usually based in the global North (and funded by governments and charities). Likewise, researchers in these countries are focused on priorities established by their tertiary sectors as indicators of esteem (for example, see the UK's Research Excellence Framework). Accordingly, while any research produced is obviously a 'good in itself', projects are measured according to certain performance metrics tightly linked to what is deemed to be work that has (narrowly defined) 'impact'. As the discussion below outlines, partners in the global South often struggle, for a host of reasons, to fit in with this presumptive framework.

Common features of such programmes include a lack of 'joined up' thinking with the funding bodies encouraging stand-alone projects. In reality, a coordinated approach within and between funding agencies would be helpful with funding priorities, project aims and objectives focusing more on African resources and needs. For many of these funding schemes, there is an emphasis on new partnerships meaning that potentially fruitful existing partnerships are side-lined. This is exacerbated by the short duration of a number of these bids which disrupts true term cooperation. Other difficulties are the logistics of purchasing and maintaining equipment, establishing labs, and ensuring technical capacity to use the facilities to their optimal capability. Furthermore, the true costs associated with researchers' time are often poorly calculated. Finally, coordination of projects between remote partners can be difficult and needs to be addressed to improve their effectiveness.

What follows is a reflection by the authors on joint projects in which they have engaged and the extent to which structural issues within the funding models have meant that collaborations have not always had the impact that they might have had. The projects discussed were/are funded by the Royal Society's Leverhulme Trust Africa Awards (LTAA), Newton Advanced Fellowships (NAF) and the Cambridge-Africa Partnership for Research Excellence (CAPREx) programmes, respectively. All three projects involve collaboration between British and African Universities, and all are focused on the identification of new drugs from natural products. Clearly, they all demonstrate that these collaborations work: the LTAA award led to the discovery of a new set of alkaloids from a novel Ghanaian microorganism with great potential as anticancer agents. Preliminary work performed by one Ph.D. student as part of the NAF project has identified four microbial strains that have shown moderate to excellent activity against the causative agent of tuberculosis, *Mycobacterium tuberculosis* (*Mtb*). The CAPREx project, in turn, has resulted in the isolation of microbial strains with strong anticancer activity.

Furthermore, all three of the awards considered place an emphasis on training, knowledge exchange, capacity building and independent research, with limited funds dedicated to sustainable infrastructure and equipment. However,

the projects also come with a number of limitations, resulting in less than optimal outcomes. A brief overview of the projects is given below, followed by an analysis of their limitations and some thoughts on potential ways forward.

24.4 Leverhulme Trust Africa Awards (LTAA)

The Leverhulme Trust (2008) Africa Awards Scheme, which was launched in 2008 with the aim of facilitating collaboration between Ghanaian and Tanzanian institutions and universities in the UK, places a significant emphasis on 'specific skills transfer to the Africa Institutions'. New collaborations are actively encouraged. The scope of the scheme spans five thematic areas—Agriculture, Water and sanitation, Basic human health research, Biodiversity and Energy—which constitute SDGs 2, 6, 3, 15 and 7, respectively (United Nations 2015; Royal Society 2011). As part of the skills transfer objective, awardees are expected to involve junior scientists including students and technicians in the day-to-day research activities as a means of developing their expertise. Not unsurprisingly, given this emphasis, training constitutes a core component of the award and training is to be carried out in-country, unless the only available option is to train in the UK.

The project under review was entitled 'Investigation of Secondary Metabolites from Ghanaian Marine Organisms and their Bioactivity' which aimed to use Ghanaian marine invertebrate and marine microbial biological resources to find potential treatments for diseases endemic to Africa including malaria, HIV and AIDS, tuberculosis and cancer, and therefore relevant to SDG3 (Huang et al. 2015). A subsidiary aim was to carry out a marine biodiversity survey of Ghanaian reef invertebrates. However, a lack of safe diving infrastructure in Ghana meant that the main aim was readjusted to cover microorganisms from mangroves and arid environments. The project was originally awarded funding of £150,000 in 2008 which was to cover 3 years of collaboration, but was granted a no-cost 1-year extension owing to initial difficulties in importing materials and equipment (Royal Society 2011). The allocated funding was to cover research expenses, travel, subsistence, mobility, procurement and maintenance of equipment (equipment costs capped at £10,000 per year). This cap on equipment spending appears rather self-defeating, although this was increased for this project to a total of £50,000 given its equipment-heavy requirements. Despite the Trust's remit, there was initially no allocation for the training of staff/students. However, in 2011, an additional component of £30,000 was included for one Ph.D. scholarship bringing the maximum award to £180,000.

The 4-year duration of this project was insufficient to complete the next stage of the work—scaling up and downstream testing of the biologically active compounds identified. The challenge is to identify funding sources that will finance this next stage, the development phase, which is often difficult to fund from science-driven funding schemes. This work is currently in a dormant phase, although some work on the biosynthesis of the bioactive compounds was carried out during a subsequent CAPREx award.

As is often the case in such collaborations, this was a stand-alone project and not subject to renewal. The result is that while notable achievements were made, researchers have subsequently been left to seek out new collaborations and partnerships (many UK funding bodies place an emphasis on new partnerships). A measure of success of the project was the procurement of a nuclear magnetic resonance spectrometer by UG, which allowed for significant contributions from the Ghanaian partners. Lastly, the late subsequent funding for training purposes somewhat undermined the LTAA's stress on skills transfer. In short, this project laid the groundwork for some really innovative and far-reaching research—research that would have benefitted from a longer term commitment and allowing the project participants from developing the discoveries to the next stage.

24.4.1 Newton Advanced Fellowships (NAF)

The next case study involves the Newton Fund, and in this instance, the Newton Advanced Fellowship (NAF). The UK's Newton Scheme aims to develop capacity in the 18 N countries, which are global emerging economies which the UK has targeted for future partnership in science and business (Royal Society 2018). The main aim of the project under discussion is to screen, isolate and identify novel bioactive natural product molecules from an existing collection of about 100 actinomycetes in an effort to discover new and/or more effective antitubercular agents. Therefore, like the LTAA project, it is also relevant to SDG3. The project, a collaboration between the University of Cape Town (UCT) and the University of Aberdeen (UA) which began in November 2016, was awarded £96,000 for a 3-year period. This includes a component of £15,000 per year for research support to cover costs for consumables, equipment, Ph.D. studentships (excluding fees) and staff. NAF also includes an optional salary top-up of £5,000 per year for the African group leader, which was not requested for this project.

So far, the project has produced some extremely promising avenues of research with respect to the molecular diversity and biomedicinal potential of South African actinomycetes in facilitating tuberculosis drug discovery. Through this NAF, the Ph.D. student had the opportunity to spend three months with the UK collaborators in the Marine Biodiscovery Centre at UA, where they successfully isolated and identified (at least) six compounds. Further investigations of these different strains that have shown promising biological activity against *Mtb* are ongoing, and we anticipate the isolation and identification of many more bioactive natural product molecules during the course of this collaborative project. However, given the 3-year duration of the NAF, we are unlikely to be able to capitalise fully on the bioactive compounds discovered as there is no obvious mechanism for continuation of this research project into the development phase.

As will be discussed in more detail below, like with the LTAA, is the relatively tight restrictions on equipment purchasing. Teaching, training and building capacity without the necessary equipment obviously have serious implications on quality. Relaxing these restrictions would gradually help African universities and research institutions acquire the critical mass of equipment that would eventually offset our infrastructural deficit and promote effective research activities.

24.4.2 The Cambridge-Africa Partnership for Research Excellence (CAPREx)

CAPREx (2018) is a three-way partnership between the University of Ghana (UG), Makerere University (MU) and the University of Cambridge (UC) that seeks to strengthen Africa's capacity for sustainable excellence in research through close collaboration with the region's most talented researchers. The SDG objectives vary with the different research projects, which are expected to be relevant to Ghana and Uganda. The programme is funded by Carnegie Corporation of New York and the Isaac Newton Trust and sponsors the African partner for 1–6 months to engage in research training with collaborators in UC. However, all the partners are expected to contribute both in cash and kind to support prospective awardees. In addition, collaborating partners whose projects require extra consumables are eligible to apply separately for a maximum amount of £20,000 from the Alborada Research grant (CAPREx 2018). Unlike the LTAA and the NAF, there is no specific allocation for purchase of equipment. The scheme provides opportunity for the UC collaborator to visit the African partner in order to strengthen collaborations. Funding for attending one international conference is also available for fellows to showcase their work in Europe or North America.

The project under review, titled 'Marine-derived actinomycetes from Ghanaian

wetlands: genetic sequences, chemistry and bioactivity', has so far provided promising results. From only two whole genome sequenced microbes, seven novel metabolites have been isolated and characterised, but more exciting is the isolation of strains that possess the ability to biosynthesise gold nanoparticles with strong anticancer activity, thus opening up an entirely new research prospect in natural product drug discovery.

The CAPREx programme has benefitted between 32 and 40 different fellows since its introduction in 2013. Most of the experiences that have been shared publicly by the fellows on the Cambridge-Africa blog and also at CAPREx Fellows' meetings both in Ghana and Uganda have been positive. However, some observed challenges are highlighted below.

24.5 Challenges and Proposed Solutions

The overall goals of the three North–South collaborative schemes examined in this chapter are indeed laudable and undoubtedly relevant to Africa's development and SDGs 3, 4, 9 and 10. Clearly, the three schemes, LTAA, CAPREx and NAF emphasise the need to solve local problems using local resources by training local talent with the anticipated benefits including economic and welfare development, innovative partnerships and total well-being of the African community. An additional aim of the LTAA was to show that these projects provided solutions to local problems and thus to leverage continuation funding from the host institution or national funding schemes. The following section focuses in more depth on some of the challenges identified above within the schemes and possible solutions to address them.

First, there is a huge challenge of strengthening the capacity of African research laboratories through the provision of relevant equipment. Currently, there is no single North–South collaborative funding opportunity that allows for the purchase of large equipment like X-ray, Nuclear Magnetic Resonance (NMR) spectrometer and Mass Spectrometer (MS). Many research funders will allow the purchase of small scale 'project specific' equipment from the budget, leaving the majority of the funds for mobility, staff and research costs, but consider the funding of large scale 'multi-user' equipment the remit of the host institution, although these can be obtained via donations or funding schemes aimed at equipment purchase. Teaching, training and building capacity without the necessary equipment have implications on the continuity of research projects and by extension, the achievement of the SDGs. Problems can also be artificially generated by the way that finances are allocated to these projects. The LTAA and NAF have a yearly report and disbursement structure with 2–3 months periods between the submission of reports and subsequent availability of funds as opposed to one-off disbursements. The awards are split into three parts, which are made available to researchers every year after a report is submitted with the exception of the first year. Hence, funds allocated for equipment is also split into three parts with the last payment coming in at the time when the project is about to end. There are instances where researchers have used a large part of the first year disbursement for the purchase of equipment, only to realise that as bad strategy.

Furthermore, the limited amounts of funds allocated to equipment makes it difficult to pursue good 3–5-year warranty deals for small equipment, installation and running costs. In the LTAA described in this chapter, the larger equipment budget allowed was allocated upfront, thus circumventing these problems. A general solution to this problem for other funding schemes could be to incorporate full disbursement for the acquisition of equipment in year one, coupled with a good warranty and some running costs, as was allowed in our case for the LTAA. Depending on the size of the investment, there could also be recognition from the funders that this equipment will serve a 'future good' and

should be viewed as a long-term investment strategy, rather than something specifically project related.

While it is expected that such equipment might form a lasting legacy from such projects, there are acknowledged problems with running and maintaining sophisticated equipment in an African context. This includes the need for trained technical support, high-quality infrastructure, reliable power and the cost and availability of spares and maintenance. Although such problems can be resolved via the training of technical staff, purchase of additional equipment (e.g. uninterrupted power supplies), building of facilities (e.g. climate controlled rooms) and paying premium prices for spares and maintenance, this increases the total costs above those that can be easily sustained within capacity development projects without detriment to other budget headings within the project. Moreover, until there is a critical mass of instrumentation in African countries, the availability of technical support, maintenance and spares could remain a problem as suppliers may not consider these countries a viable market.

While this situation will resolve in the much longer term when funding from the global North leverages domestic inflows from African institutions and their governments, an interim solution is to establish regional centres of excellence (CoEs) because of their obvious advantage of shared running costs. Remarkable strides have been made in this regard by South Africa that must be emulated by other African countries. The South African government provides matched funding for external support for research and has also exhibited massive commitment in finding solutions to Africa's disease burden through support for the creation of CoEs. These include the Centre of Excellence for Biomedical Tuberculosis Research (CBTBR) and Africa's first drug discovery centre (H3-D), with an initial focus on tuberculosis and malaria, both based at the University of Cape Town.

Still related to equipment, African policy makers should reconsider the detrimental effects of the long bureaucratic procedures and high costs of clearing scientific equipment and consumables on research aimed at realising the SDGs in Africa. Equipment designated for use in academia and research institutions should be free from clearance charges to avoid, for example undue delays in project delivery times. African governments should wholly embrace this suggestion as a basic contribution towards the solution of problems in their own countries. Donors might also take into account the lag between the purchasing of equipment and its installation and availability as a result of the above.

Second, there seems to be a general drawback in the duration and continuity of the North–South collaborations discussed so far. For both the LTAA and NAF programmes, long-term sustainability of research projects is mentioned but the means to achieve this is not stated clearly. The UK's Global Challenges Research Fund may provide a route to continuity, but the calls are very specific with characteristically short time frames for applications. The LTAA programme focuses on new collaborations which makes it difficult to continue established productive collaborative research work as clearly highlighted above. Successful projects could be considered for additional support into a development process. Likewise, the 1-year duration of the CAPREx scheme is too short to allow the achievement of meaningful results on projects. Since the programme does not support payment of salaries for 12 months, applicants can request for only a 6-month study leave from their home institutions to study at UCT.

The implication is that on their return home, they must immediately take up their scheduled academic work, leaving little room to tie up any unfinished work. Furthermore, the scheme does not provide clear-cut continuity of the research with the UC collaborator. There are also challenges with finding suitable accommodation in Cambridge, which prevent fellows from committing the 6-month period to full research work, as well as access to needed facilities in other research groups. Thus in the midst of plenty, African partners still struggle to do very simple things with negative effects on the project delivery times. Efforts should be made to

encourage buy-in by the UC community to promote stronger collaborations.

Third, it is crucial that the exact role/responsibility of all collaborating partners within the research projects is clearly defined. There should be no ambiguity as to who is paying for what and what is being offered in kind. A case in point is the CAPREx programme where apart from payment of subsistence for African Fellows by CAPREx, all expenditure on the scheme including running costs of research and consumables, use of equipment and relevant software is paid directly from the Alborada fund, which is purposed to serve as additional support for research expenses. UC does not make direct financial contributions to the project, thus, the African collaborators return home with a small leftover budget, which does not support continuity of their projects. It is proposed that UC facilitates free access to equipment as their contribution to research running costs while UG/MU provide top-ups to the budgets of the African Fellows.

Lastly, the element of adequate funding for full-time MSc and Ph.D. training is missing from many North–South collaborations. Initially, the LTAA programme had no specific budget lines for postgraduate training so most PIs had to squeeze funds to support students who conducted various aspects of the research. Later, after a lot of deliberations to convince funders, £30,000 was added to the LTAA to support one Ph.D. scholarship per year. The NAF project also suffers from this lack of support for postgraduate students, since Ph.D. studentships are included within the £15,000 per year for research costs, which includes consumables and equipment. In South Africa, local funding sources, for example the National Research Foundation (NRF), also do not sufficiently support postgraduate students through projects, but do so rather on individual applications.

Therefore, future North–South collaborative research projects should make provisions for sufficient funds for the African partner to adequately support the training of postgraduate students and postdoctoral fellows, especially international ones. Another challenge associated with scientific research in Africa is that technicians/research support staff in academic institutions lack adequate training and motivation. The LTAA and NAF programmes encourage direct involvement of junior scientists to improve on their skills but, there is no specific allocation of funding for comprehensive and intensive training of support staff. The result of this is an island of very well-trained Ph.D.s surrounded by support staff, the majority of whom may not fully appreciate or comprehend research activities.

24.6 Conclusions

The realisation of global health and well-being (SDG3) is hinged on the ability of Africa to respond appropriately and timely to its disease burden. An appropriate response will be shaped largely by the quality of African scientists (SDG4), the provision of relevant infrastructure and logistics (SDG9) and reduced inequalities (SDG10). Many interventions have been provided through the improvement of scientific research capabilities of African scientists in North–South collaborations in skills transfer. However, the quest for 'genuine collaborations' and equitable sharing of resources between funders and beneficiaries has long featured high among the aspirations of African scientists. This is an urgent call for African governments to significantly complement the support of the global North in their commitment to research in drug discovery and development on the continent since there is ample demonstration of research outcomes and outputs that should convince them that investment in science and human resource is critical to the attainment of the SDGs.

In summary, genuine collaborative projects that aim at addressing health and well-being (SDG3) in Africa should address a number of critical points. The first of these is the extension of the current focus on skill transfer to include the building and maintenance of sustainable infrastructure. Second, North–South collaborative bids should be structured to emphasise the need for scientific research into problems defined by the African scientists that address local,

national or regional needs. African Governments should set the agenda of funding calls and propose maximum funding from the North and top-ups from the South to ensure buy-in from all partners. Also essential are the establishing of means to allow the continuation of successful North–South partnerships that have thrived under much smaller research projects to ensure realisation of goals. This could encompass the idea of clear-cut continuity plans that support collaborative efforts for a minimum of 5 years.

A pool of knowledge from previous projects could be formed assisting with the proper and correct estimates of logistics for purchasing equipment, establishing laboratories and ensuring technical capacity as well as the proper estimation of costs associated with the researchers' time, coordination of research and administration. To give the African staff and students the best possible training and continued access to state-of-the-art facilities and equipment, training programmes that are based in Africa are essential and must be linked with the purchase and installation and maintenance of relevant major equipment with warranty periods of more than 5 years. Finally, the success of projects should be measured mainly by the level of involvement by African stakeholders and their governments, and the contributions they make to solving local, national or regional problems.

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25 A Collaborative Framework Highlighting Climate-Sensitive Non-communicable Diseases in Urban Sub-Saharan Africa

Hanna-Andrea Rother, Clive E. Sabel and Sotiris Vardoulakis

Abstract

Climate change vulnerabilities are key environmental and social determinants of health, particularly in sub-Saharan Africa where public health and other infrastructure are not yet geared towards counteracting the potential impacts of changing climates. Health-related climate change adaptation research for sub-Saharan Africa is limited and existing research is not effectively translated into practical advice for decision makers. A World University Network (WUN) collaboration project was started in 2016 to investigate climate change impacts on non-communicable diseases (NCDs). This interdisciplinary collaboration, established through the Healthy-Polis International Consortium for Urban Environmental Health and Sustainability focuses on the intersection of health, climate and sustainability within urban environments through innovative research methods, co-production of knowledge, capacity building and intervention. NCDs like cancers, asthma, diabetes, cardiovascular disease and mental health are on the increase in sub-Saharan African urban areas and can be further aggravated by climate change. If NCDs and the climate nexus are unaddressed, they will undermine achieving several of the Sustainable Development Goals (SDGs). Principally, we highlight climate-sensitive NCDs impacts on vulnerable populations, i.e. women, children, elderly, immune compromised and people with low socio-economic status, throughout their life course. We argue that interventions need to target disciplinary and sector 'intersections' for effective adaptation strategies. These interventions should be specifically linked to four SDGs, namely, SDG 3 (Good Health and Well-Being), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). We conclude with capacity development and policy guidance to strengthen sub-Saharan African countries ability to address climate-sensitive NCDs.

Keywords

Climate change · Non-communicable diseases · Sustainable development goals · Sub-Saharan African · Urban development

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25.1 Introduction

Climate change has a range of direct impacts on health, mainly related to extreme weather events, as well as acting as a risk modifier in most cases

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exacerbating health risks and inequalities related to poor air and water quality, land use and ecological change (Watts et al. 2015). Although climate change has been recognised as the leading public health challenge of the twenty-first century, its overall health burden (particularly in sub-Saharan Africa) has not been fully quantified, apart from temperature-related effects (Hajat et al. 2014; Oni et al. 2016; Vardoulakis et al. 2015) and it does not feature in Global Burden of Disease studies (Lim et al. 2012; Cohen et al. 2017). Non-communicable diseases (NCDs), a defining challenge of the twenty-first century, have either received relatively little attention or been examined in isolation in climate change and health research (Friel et al. 2011; World Health Organization (WHO) 2014). However, certain common NCDs such as asthma, diabetes (type 2) and cardiovascular disease are 'climate-sensitive' as the severity of their symptoms can be affected by climate change conditions (e.g. increasing temperatures) (Colagiuri 2013). Prevalence of these diseases is persistently high in many high-income countries (Lim et al. 2012) and amplified by increasing urbanisation in low- and middle-income countries (LMIC) which have a predicted growth in NCD-related mortalities (Friel et al. 2011; Nojilana et al. 2016).

The prevalence of type 2 diabetes and cardiovascular disease increases with age, which has critical implications for healthcare, social services and energy consumption in ageing societies (International Diabetes Federation 2012). Prevalence of asthma is generally higher in childhood, but also persistently high in older ages. Pests prevalent in urban areas are also climate-sensitive resulting in increased pest populations, and the increased use of hazardous pesticides to control these. Exposure to endocrine disrupting pesticides used in urban (particularly low income) housing puts populations at risk of metabolic disruptions (Rother 2010), including interruptions with hormones, raising concerns in regard to 'developmentally induced NCDs'—diabetes, asthma, cancer—resulting from chemical metabolic interference (e.g. epigenetics) and metabolic syndrome (e.g. type 2 diabetes) (Barouki et al. 2012; Dang et al. 2017).

In this chapter, we explore the interlinkages between certain leading NCDs (asthma, diabetes [type 2], cardiovascular disease and pesticide-related diseases—particularly cancer and endocrine disruption) and climate change, focusing on biological plausibility, epidemiological evidence and vulnerability implications for urban settings, particularly in low-income sub-Saharan African residential areas. Increasingly, poor mental health and well-being in these areas in response to climate change is coming to the fore as an issue. We also discuss the implications of climate change mitigation and adaptation policies for NCD prevalence. Finally, we identify opportunities for intersectoral interventions and research using a holistic, system-based approach.

25.2 Collaborative Framework

This chapter emanates from a World University Network (WUN) funded collaboration between the authors and others starting in 2016. This interdisciplinary collaboration developed within the Healthy-Polis International Consortium for Urban Environmental Health and Sustainability (www.healthy-polis.org) focuses on the intersection of health, climate and sustainability within urban environments through innovative research methods, co-production of knowledge, capacity building (including research translation and training) and intervention development and evaluation. The collaborative framework (Fig. 25.1), within which this chapter grew, was established during a 2016 workshop of approximately 30 researchers discussing:

- *challenges posed by climate change and NCDs in cities*,
- *international approaches to healthy urban planning and sustainability and*
- *integrated assessment of urban planning interventions.*

The collaboration focus was for researchers and practitioners from different disciplines to interact and identify key NCD—climate-related issues and what this could mean for sub-Saharan

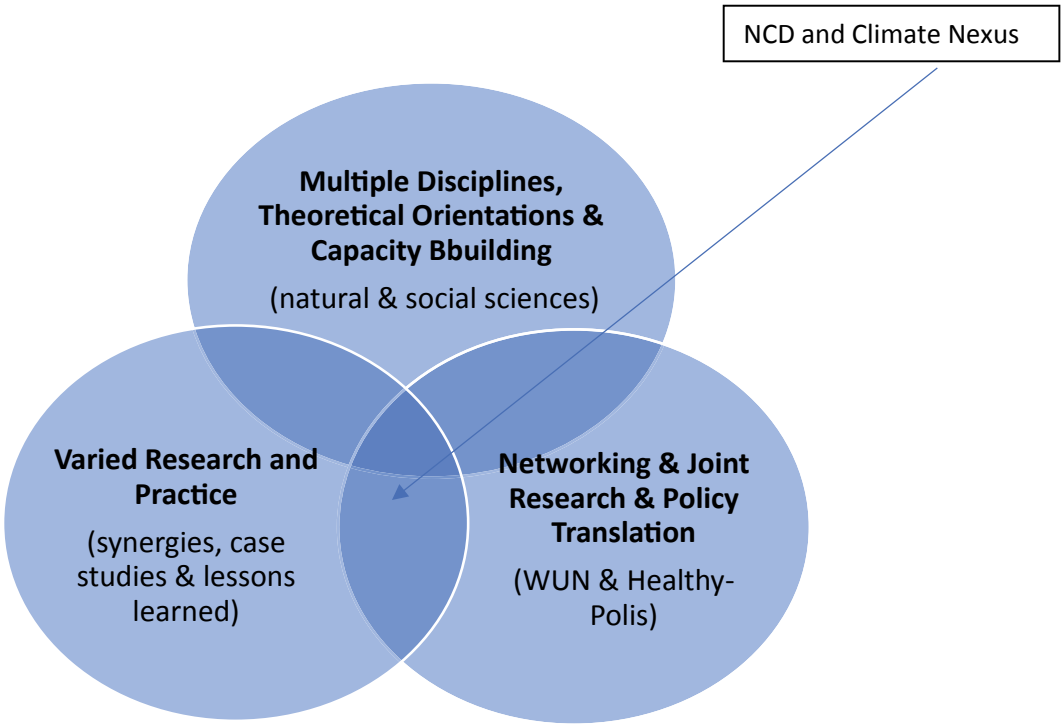

Fig. 25.1 Collaborative framework for NCDs and climate change in sub-Saharan Africa (Authors)

African low-income urban areas, building on global research and experience. Participants were from New Zealand, South Africa, Hong Kong, The Netherlands, Australia, China and the UK.

25.3 NCDs and Climate Nexus for Urban sub-Saharan Africa

To illustrate the concerns that the influence of climate change could have on exacerbating the impact of NCDs in sub-Saharan African urban areas, we draw on the global literature. We particularly focus on NCDs of concern for urban residents and these include asthma, type 2 diabetes, cardiovascular disease, cancer and endocrine disruption related to pesticide exposures, and mental health and well-being. Use of highly hazardous pesticides in urban informal (slum) settlements for pest control (e.g. rats, cockroaches, bedbugs, flies) is an extensive problem in sub-Saharan Africa, but an under-researched and silent public health issue (Rother 2010, 2014; Dang et al. 2017). We predominantly highlight the need to understand common pathological pathways in these key NCDs which are at risk of increasing prevalence from both the impact of urbanisation and climate change. That is, that these NCDs are particularly 'climate-sensitive'. With NCDs globally a leading cause of 65% of all deaths with 80% occurring in LMIC, the concern is that climate change may play a role in exacerbating their impact (Lozano et al. 2011).

There are limited resources, awareness and sometimes political will in sub-Saharan Africa to address health issues related to climate change and move towards achievement of the Sustainable Development Goals (SDGs). Attempts to reduce risk of a variety of diseases, while providing additional environmental, health, and socio-economic co-benefits, would see the best use of these limited resources. In the more industrialised world, there has been a rise in prevalence of NCDs, broadly defined as the big five diseases of

the twenty-first century: cancer, asthma, heart disease, diabetes and mental health, and accompanying burden on the public purse over the last 50 years. Rise of these NCDs can partly be attributed to the wide availability of antibiotics since the mid-twentieth century, establishment of clean water supplies and the concomitant decline in mortality and morbidity from infectious diseases. With the increasing urbanisation of the world's population in LMIC, it is predicted that NCD incidence globally will also increase with sub-Saharan Africa having the highest increase of NCD-related mortality (Nyaaba et al. 2017). sub-Saharan Africa has thus seen an epidemiologic transition from a predominantly infectious to NCD burden. NCDs are also what is termed complex diseases because drivers of risk for them include multiple interacting environmental, genetic and behavioural risk factors.

25.3.1 Asthma

There is evidence that climate change may exacerbate asthma prevalence due to higher ground-level ozone concentrations, expansion of areas affected by allergenic vegetation species and potentially longer pollen seasons. Grass pollen has been associated with emergency hospital admission for asthma in London (Osborne et al. 2017), and asthma exacerbations have been associated with high air pollution days in England (Elliot et al. 2016), Paris (Bouazza et al. 2017) and South Africa (Olaniyan et al. 2017). Although the relationships between climate, air pollution, vegetation and asthma exacerbations are complex (Alcock et al. 2017; Heal et al. 2013), there is some evidence indicating that people who live in urban areas may be more affected by allergenic asthma than those who live in rural areas (Salmond et al. 2016).

Traffic-related air pollutants have been associated with asthma incidence and prevalence ('the urban factor') at population level (D'Amato et al. 2015), although the strength of the association varies with pollutant, age group and lag structure of the epidemiological analysis. The mechanism of interaction between air pollutants and induction of asthma is not clear; however, proximity to heavy-duty vehicle traffic and increased traffic volume can exacerbate asthma in susceptible individuals (Gowers et al. 2012). Young children with asthma are particularly susceptible to air pollution because of their developing lungs, immature metabolic pathways, high breathing rates per body weight and amount of time spent exercising outdoors (Guarnieri and Balmes 2014). In a study in Kenya, the prevalence of exercise provoked bronchial reactivity (an indicator of asthma) in children living in urban areas was substantially higher than in children living in rural areas (Ng'ang'a et al. 1998).

Indoor environmental conditions, such as prevalence of tobacco smoke and other combustion products, house dust mites and pollen may aggravate asthma symptoms (Vardoulakis et al. 2015). Climate change adaptation and mitigation measures in the built environment in sub-Saharan Africa may alter ventilation patterns (e.g. with houses becoming more airtight), which could lead to a worsening of indoor air quality, particularly in areas where the prevalence of indoor smoking and use of solid fuels for cooking and heating is high (Vanker et al. 2015).

Urban green spaces help mitigate the urban heat island effect, can reduce air pollution and provide opportunities for flood risk management and physical exercise in sub-Saharan African cities, but can also be a source of allergenic pollen and biogenic volatile organic compound (VOC) emissions if the wrong vegetation species are planted. Residential exposure to natural environments has significant association with local rates of asthma hospitalisation and interacts with long-term exposure to air pollutants (Alcock et al. 2017).

Well-targeted climate change mitigation/adaptation interventions which are context appropriate (e.g. urban greening, education programmes) can reduce exposure to allergenic pollen, air pollution and temperature extremes, improving thus respiratory health and reducing asthma rates. Attention to wasteland and brownfield sites within the urban environment may also play a special role. The allergenicity of several weedy species has been noted and these

urban sites are environments where weedy species will thrive, near high population density. These may present a new challenge of inserting an ecosystem to enable the growth of a balanced 'natural' environment, not harmful to the cities citizens (Ziska et al. 2003).

25.3.2 Type 2 Diabetes

The interrelationship between type 2 diabetes and climate change is both direct and indirect (Dain and Hadley 2012). More frequent and prolonged periods of extremely hot weather in sub-Saharan African cities can affect the management of type 2 diabetes, especially since insulin stability is associated with extended heat exposures (Cook et al. 2011). Climate change-induced droughts may result in higher food prices which could reduce city dwellers' ability to purchase healthy food. This may result in more reliance on energy-dense highly processed food products, which could increase obesity and diabetes prevalence especially in low-income countries in sub-Saharan Africa. Globally, up to 30% of greenhouse gases come from agriculture (Vermeulen et al. 2014). Attempts to curb climate change may see a change in people's diets. While red meat (and associated saturated fat) reduction from diets may see positive health outcomes, reduction in availability of meat in the diet of children especially in early years, in low-income sub-Saharan African countries with low protein availability, may lead to negative health outcomes (e.g. under-nutrition). Higher ambient temperatures may also prevent people from exercising regularly and promote sedentary lifestyles, which could have a negative effect on the management of type 2 diabetes (e.g. obesity) (Dain and Hadley 2012). Urbanisation, which rapidly changes lifestyles and increases exposure to risk factors including motorised transport, insufficient physical activity and unhealthy diets, is strongly associated with type 2 diabetes risk (International Diabetes Federation 2012). Both over-nutrition and under-nutrition increase an individual's risk of developing type 2 diabetes and related NCDs (International Diabetes Federation 2012).

Sedentary lifestyles—defined by high levels of motorised transportation, inactive occupations and insufficient physical activity—are increasing worldwide and in sub-Saharan Africa where rapid urbanisation with the increase in rural-to-urban migration has led to lifestyle changes (Twinamasiko et al. 2018). Physical inactivity is one of the four leading NCD risk factors and accounts for nearly a third of type 2 diabetes prevalence (International Diabetes Federation 2012).

Exposure to air pollution has been associated with increased risk of type 2 diabetes (Rajagopalan and Brook 2012; Meo et al. 2015) and there is also recent evidence suggesting that air pollution, a persistent problem in many sub-Saharan African cities, is a risk factor for childhood obesity (Wei et al. 2016). Of concern is that extreme heat and air pollution events often happen simultaneously each potentially negatively impacting the other (Cook et al. 2011). Ambient temperature is also an independent risk factor for diabetes mortality and morbidity (Lu et al. 2016; Yang et al. 2016).

People with diabetes are predisposed to cardiovascular events during heatwaves and higher mortality from heart attack on days of high air pollution (Cook et al. 2011; International Diabetes Federation 2012). The increase of extreme climatic events is likely to damage healthcare infrastructure and threaten the delivery of care for vulnerable people with diabetes (International Diabetes Federation 2012). Urban environments that promote healthier diets (Milner et al. 2015) and increased physical mobility would help reduce type 2 diabetes prevalence. Opportunities exist to unite climate change mitigation strategies with those promoting population health and diabetes prevention, including transport, urban design, educational programmes and food policies (International Diabetes Federation 2012).

25.3.3 Cardiovascular Disease

Cardiovascular disease (CVD) risk is largely affected by lifestyle choices (diet, smoking, etc.), as well as exposure to environmental stressors. CVDs, including acute myocardial infarction,

heart failure and stroke, have been associated with outdoor air pollution and are sensitive to temperature (Cook et al. 2011; Cosselman et al. 2015). Diet and physical activity are other major determinants of CVDs. These factors are moderated by the 'obesogenic environment', a concept linking food policy, urban planning and building architecture (Chow et al. 2009).

Increased active travel in cities (i.e. cycling and walking replacing short car journeys and public transport replacing longer car journeys) would reduce greenhouse gas emissions from the transport sector, increase physical activity levels and improve cardiovascular health (Woodcock et al. 2009). Community walking groups may be an option for those living in low-income sub-Saharan African communities with long commutes to work. Community health workers should be involved in urban planning and health communication initiatives aiming to address CVD. Walkable proximity to healthy food outlets could help adopt healthier diets (e.g. reduced red/processed meat consumption) as well as reducing greenhouse gas emissions from the food sector in sub-Saharan Africa (Milner et al. 2015). Exposure to higher temperatures due to climate change will also pose a direct risk on urban dwellers with pre-existing CVD, as well as on healthy individuals carrying out heavy labour due to the surplus internal heat created by muscle work (De Blois et al. 2015).

Heat-health warning systems and built environment interventions (e.g. external shutters) could reduce exposure to heat and improve cardiovascular outcomes. However, some energy efficiency interventions, such as increased housing insulation, may exacerbate building overheating (Picetti et al. 2016). Also, natural ventilation through window opening may be restricted due to security concerns in certain urban areas in sub-Saharan Africa.

Solutions for one problem may see the rise of alternate scenarios unforeseen with the implementation of mass city-wide changes. Reducing domestic property envelope permeability to counter heat loss in attempt to reduce carbon footprints of buildings may have increased risk of condensation and dampness and associated growth of house dust mites and fungi, both linked to allergy and allergic asthma. Interventions in sub-Saharan Africa need to assess if increased active travel increases the risk of people being exposed to higher levels of traffic pollution or road fatalities.

25.3.4 Pests and Pesticides—Cancer and Endocrine Disruption

Urban areas in sub-Saharan Africa, and particularly low-income communities (informal settlements or slums), are plagued with pest infestations within and around homes from cockroaches, rats, flies, bedbugs, lice, fleas and ants (Rother 2010). Poor housing, infrastructure, sanitation, refuse disposal and overcrowded living areas that promote pest infestation are often subjected to extreme climate conditions such as floods which impact on health. Most of these pests are climate-sensitive and increasing temperatures often results in more pests (i.e. increased generations per year) (Barata 2017). For example, houseflies, who play a significant role in spreading disease (e.g. dysentery, diarrhoea), are susceptible to temperature fluctuations and known to increase development (hatchability) when the temperature rises (Sallam et al. 2017). Several studies have illustrated the fluctuations that are occurring to the status of vector-borne diseases because of climate variability (Medlock and Leach 2015; Dang et al. 2017). In the non-health literature, there is discussion of the increase of rat populations and flies, to crisis proportions, in urban areas resulting from urbanisation and climate change (Dang et al. 2017; Parsons et al. 2017). The health literature predominately focuses on vector-borne diseases, while relatively little attention has been paid to potential hazards associated with the extensive pest populations afflicting urban areas in low-income communities.

Urban populations in LMIC tend to rely on pesticides to control urban pests (Barata 2017). As pest population density increases becoming a nuisance and exposing low socio-economic communities to potential diseases, there is a

risk of increased use of pesticides. Many used by the urban poor in sub-Saharan Africa are often illegal and highly hazardous and referred to as *street pesticides* (Rother 2016; Dang et al. 2017). Several of these pesticides are linked to various cancers and endocrine disruption (Dang et al. 2017), as well as type 2 diabetes (Evangelou et al. 2016) and obesity (Dirinck et al. 2011).

With urban pests being climate-sensitive as well as vectors of disease, and the potential health effects from exposures to pesticides, sustainable and low-toxic pest management is key. Pest management, however, seldom is intersected with urban planning, housing developments, poverty alleviation policies and climate adaptation strategies in sub-Saharan Africa. From a life course approach to preventing NCDs, pesticide exposures need to be prevented from the foetus to old age. With climate variability inevitable to a large extent, urban pest management strategies and policies should incorporate control methods taking climate into account.

25.3.5 Urban Mental Health and Well-being

It is increasingly clear that climate change poses serious threats to human health via NCDs, but the impacts on positive health, or well-being, have been less well studied (Hiscock et al. 2014; Thomas et al. 2014). In its most serious form, adverse climate impacts on well-being approach mental ill-health. The likelihood of climate change to amplify the impact of NCDs resulting in chronic physical disease may result in mental strain (Padhy et al. 2015). WHO predicts that by 2030, in an increasingly uncertain world, depression will be the most widespread health problem on the planet, in the top three of all-cause morbidity, in all continents (World Health Organization 2012). While this is of course not due only—or even primarily—to climate change, living with and adapting to a changing environment will result in more stressful circumstances for many people. Extreme weather events impacts (e.g. floods, fires) can also lead to Post Traumatic Stress Disorder which informal urban areas in sub-Saharan Africa are increasingly experiencing (Hayes et al. 2018).

There are opportunities to achieve co-benefits from actions that seek to reduce the harmful emissions of climate-altering pollutants and at the same time, improve human health and well-being. Milner et al. (2012), for example, emphasise how housing energy efficiency impacts upon urban air quality, thermal comfort and associated well-being, and has co-benefits associated with reductions in certain types of chronic disease. Others have pointed to the joint benefits afforded by policies that promote cycling and walking over motor vehicle use in cities (Younger et al. 2008).

The benefits of urban green—and increasingly blue (water)—space for health, well-being and climate change mitigation and adaptation are also now receiving more attention. Well-managed urban green space is associated with cleaner air, a reduction of the urban heat island effect and a reduction in vehicular transport use (Liu et al. 2016) and has been considered alongside broader sustainable development strategies in relation to transport, housing and green space, in which 'green' outcomes can have health and well-being co-benefits. In poor communities, these create spaces for communal exercise such as outdoor gyms.

25.4 Climate Adaptation for NCDs Linked to SDGs

sub-Saharan Africa is particularly vulnerable to the effects of climate change due to the projected significant increases in extreme heat events, changing rainfall patterns, more droughts, sea leave rise and vector-borne diseases. Many of these changes are likely to affect disproportionally rural areas dependent on 'rainfed' agricultural systems (Serdeczny et al. 2017), which will increase the already high rural-to-urban migration trend leading to rapid urbanisation and expansion of informal settlements. This will pose a higher risk of infectious disease outbreaks as well as NCDs associated with poverty, malnutrition and poor housing thus conditions; having a higher impact on vulnerable populations (e.g. women, children, elderly, immune compromised).

An EU-funded project, CLUVA (Climate Change and Urban Vulnerability in sub-Saharan Africa; http://www.cluva.eu/) developed a range of methods that can help sub-Saharan African cities manage climate risks more efficiently, reduce vulnerabilities and improve their adaptive capacity and resilience to climate change. A key recommendation from CLUVA was that integration of risk reduction measures is needed at city level to form strategic adaptation plans (Jørgensen et al. 2014). These plans should actively involve local stakeholders in the development of the evidence, design, implementation and evaluation stages.

As well as adapting to climate extremes, there is an aspirational longer term goal to transform high-carbon, obesogenic societies around the world to low-carbon active living societies (International Diabetes Federation 2012). The SDGs are an opportunity to develop healthier, climate change resilient cities in different geographic, climatic and socio-economic contexts of sub-Saharan Africa if interventions are based on robust scientific evidence, knowledge of local conditions and plan for uncertainty. Development and refinement of the scientific evidence is required for this in the areas of environmental health equity, sustainable urban environments, sustainable lifestyles and equity, climate impact on urban well-being, and interaction between climate change and other risk factors. To build urban resilience and the SDGs through research, policy and practice, interventions that are intersectoral and multidisciplinary are required (Table 25.1).

25.5 Research Translation

Key for collaboration is the translation of research findings and the implications for the various stakeholders (e.g. policymakers, researchers, public). This is in terms of how to understand

Table 25.1 Examples of intersection of NCD and climate change for adaptation interventions (Colagiuri et al. 2015; Barata 2017)

SDG	Climate Sensitive NCDs to be Addressed	Urban Pathway	Sectoral Intersections for Interventions Most Needed	Relevant SDG Target
SDG 3 *Good Health and Well-Being*	Type-2 Diabetes	▪ lifestyle* & food quality	➢ **Urban planning** ➢ **Environmental Health** (Improved env. health surveillance, health communication & health services) ➢ **Research** ➢ **Social services & development**	➢ Reduce premature mortality from NCDs by a third by 2030
	Asthma	▪ Air quality		
	Cardiovascular disease	▪ Lifestyle & lack of exercise		
	Mental health	▪ Disasters & lifestyle		
SDG 7 *Affordable and Clean Energy*	Asthma (and other respiratory & cardiovascular diseases)	▪ Air pollution (indoor and outdoor)	➢ **Urban & transport planning** ➢ **Engineering**	➢ Expand infrastructure & upgrade technology to supply modern & sustainable energy services for all LMIC.
SDG 11 *Sustainable Cities and Communities*	Cancer & endocrine disruption	▪ Pesticides ▪ Chemicals (e.g., - e waste)	➢ **Pest and Chemical Management** as part of **Urban Planning**, **Environmental Health Services** & poverty alleviation strategies	➢ Ensure access to adequate housing and basic services & upgrade slums by 2030.
SDG 13 *Climate Action*	All above	▪ Cities (urban pathway)	➢ **Urban Planning** ➢ **Health** ➢ **Climate adaptation & mitigation (Environment)**	➢ Promote mechanisms for raising capacity for effective climate change -related planning & management in LMIC

*Lifestyle in this context is both at the individual levels and takes into account the broader social, economic and environmental determinants in the urban environment within which the individual lives and works

findings, as well as set research and policy priorities for intersectoral adaptation strategies (Table 25.1) (Colagiuri et al. 2015). Implementing interventions to reduce the impact of climate change on NCDs requires researchers, particularly in LMIC, to translate research findings and implications through relevant methods for a cross section of sectors (Rother 2014). What is critical is for this research translation not to occur only within the researchers' discipline but within several sectors for the NCD and climate change link to be understood. For example, sectors include health (including public, environmental and occupational health), urban planning, sanitation, social development and education (Table 25.1).

25.6 Opportunities for Capacity and Capability Development

Despite growing awareness of the vulnerability of urban populations to climate change in sub-Saharan Africa, there is limited empirical evidence on the impacts of climate change on NCDs (Kula et al. 2013). Mental health, for example, is an emerging area in the global literature as being impacted by climate change (Watts et al. 2015; Hayes et al. 2018). There is an urgent need for further research on the impacts of future climate predications in sub-Saharan Africa, particularly for the most vulnerable urban poor, and focusing on mental health and pesticide use. This should be coupled with research on the effectiveness of climate change adaptation plans and related local interventions.

25.7 Conclusion

Although sub-Saharan African cities have contributed the least of any urban areas in the world to greenhouse gas emissions responsible for climate change, they are the most vulnerable to the NCD impacts of climate change due to the limited adaptive capacity and generally weak public health infrastructure. There exists an opportunity to mitigate both climate change and NCD impacts in urban sub-Saharan African centres through capacity and capability development to mitigate both jointly, but there is a concern that this 'window of opportunity' is closing. Many of the urban solutions discussed in this chapter (active travel, urban greening, outdoor gyms, increased health communication and improved housing) can bring multiple co-benefits for climate change mitigation and NCD prevention. The WUN and Healthy-Polis consortium provides an open platform for researchers and practitioners from different disciplines and expertise to work together towards solving this emerging and intractable threat, as well as adding needed sub-Saharan Africa focused research to the global scientific literature.

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26 Multiplex Learning: An Evidence-Based Approach to Design Policy Learning Networks in Sub-Saharan Africa for the SDGs

Serdar Türkeli, Pui-Hang Wong and Eleni Abraham Yitbarek

Abstract

Although most scholars acknowledged that development is a transnational process, existing discussions usually focus on negative externalities such as pollution, epidemics, violent conflicts and economic crises. This chapter considers a form of positive externality, knowledge spillovers and argues that countries can innovate in policymaking, both design and implementation, and achieve more sustainable forms of development by participating in a multiplex policy learning network. Furthermore, we emphasise that policy knowledge transfer should not be one-way, so global governance becomes a truly inclusive and interactive process. One fundamental problem to this end is the design of such multiplex policy learning networks. This chapter adopts an evidence-based approach to this problem. Using quantitative analysis, we identify performance-based clusters of status leaders, intermediates and followers in Sub-Saharan Africa with respect to the constituents of indicator-based performances on each Sustainable Development Goal (SDG), and offer a detailed contextualisation for multiplex policy learning in Sub-Saharan Africa with a prospective design of an international conference agenda for SDGs.

Keywords

Cluster analysis · Evidence-based policy · Sub-Saharan Africa · Sustainable development goals

26.1 Introduction

This chapter investigates how to design policy learning networks around policy mixes aiming at reaching Sustainable Development Goals (SDGs) among countries in sub-Saharan Africa (SSA) based on structural and content analyses of empirical data. The chapter proceeds as follows: Initially, we provide the theoretical and empirical background relating to policy learning, policy mixes, multiplex networks and approaches to development. Then, we present the data and discuss the method: unsupervised and supervised cluster analysis. After that, we analyse the results and discuss our findings. Finally, we offer policy recommendations and highlight future research and action directions.

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26.2 Theoretical and Empirical Background

Policy learning relies on a well-developed institutional framework, capable government bureaucracy, business policy integrated good practices and capabilities for evaluation and monitoring (Gault 2015). Hence, a policy learning network can be defined as a network of capable governmental bureaucrats and policy-relevant stakeholders at the design stage of policymaking to support data- and evidence-based decision making with transparency and accountability. Policy networks enable production and dissemination of socially relevant data, information, knowledge and policy learning over time at local, national and international level. Each policy learning network, thus, should include not only policymakers but also actors from businesses, universities and non-governmental organisations to extend the scope of micro level-bounded rationalities and to avoid aggregated issues at higher levels due to meso-level sector-specific or macro level country-specific purposive rationalities (Metcalfe 1994; Türkeli and Wintjes 2014; Blohmke et al. 2016). But how can we determine which policy themes and actors should take a more central position in a policy learning network at international level? We propose that the answer depends on three criteria: an actor's fields of expertise, an actor's performance measured by an indicator, and the relationship between actors and indicators. In this way, policy learning is tied to actors' domain expertise and achieved contextual outcomes. This type of policy intelligence is expected to be networked, and as a result, better policy alternatives can be designed, and policy performance can be improved (Nauwelaers and Wintjes 2002; Smits and Kuhlmann 2004).

Determined by the nature of the indicators set to measure the progress in reaching a target and eventually a goal, a policy learning network includes relevant actors, e.g. business groups, universities, ministries, consultancies, non-governmental organisations and even international organisations and independent experts. The constellation of these actors constitutes the multiplicities of policy issue networks under a given policy theme. Policy learning is then not only about learning the final policy and associated instruments but also the policy cycles, from design to implementation, from monitoring to evaluation (Dunn 2015; Stone 2012). The same principle also applies to a policy sub-theme; for example, innovation policy and public research and development funds under SDG 9 industry, innovation and infrastructure. Thus, a policy learning network is not a unidimensional monoplex network but a multiplex network (see Mucha et al. 2010).

In this chapter, we define a macro level multiplex network as a network of countries that is organised on the basis of performance in different policy themes (SDGs). We define policy mix as a collection of policy themes and sub-themes. Considering the multilayer feature of multiplex networks, a country can simultaneously be a frontier in one policy (sub-)theme but an intermediate performer or a follower in another. This allows countries to interact and learn from each other about different policy mixes simultaneously. This kind of multiplex arrangement facilitates simultaneous policy learning about the micro-constituents of related policy practices among countries which are at the performance core, semi-periphery, periphery of a learning network (McCann and Ward 2012).

Due to the structural limits of monoplex networks where a node/country can operate only in one network, the debates over conceptions of development are also constrained and collapse onto reductionist interpretations of development. In this chapter, we propose the contrary, a more dynamic approach to sustainable development. We argue that a country can be at a performance periphery for some policy sub-themes with respect to its performance relating to sustainable development, but at the semi-periphery (or at the core) in others. Development has long been considered as an interrupted process. For instance, Cai (2012) showed that economies with high rates of growth tend to encounter economic slowdown or even stagnation at specific middle-income stages. Scholars have been searching for a cure of this middle-income trap phenomenon but fail (Eichengreen et al. 2013). We follow a different conceptualisation. Rather

than locating an entire country in a mutually exclusive, linear periphery, semi-periphery or core category, which outweighs structures over actors, we reveal a data-driven multiplex system structure, which opens a multilayered policy mix (content) space for actors to learn and improve policies relating to SDGs performance. Thus, our study also contributes to the world systems analysis (Wallerstein 2004) by bringing actors back to structures. Implications follow in terms of multiplex policy learning and multiplex policy learning networks in multidimensional development trajectories in a world-system.

26.3 Data

We use Sustainable Development Goal (SDG) indicators compiled by Jeffrey Sachs et al. (2017). The correlation matrix among each SDG performance score is presented in Fig. 26.1. The shape and the orientation of ellipses indicate, respectively, the strength and the direction of the correlation among two SDG performance indicators. The colours indicate negative (red) or positive (green) correlations. We omitted SDG 14 (Life below water) because the data on most land-locked countries are missing. The order of the indicators and countries is sorted such that similarly behaved SDGs and countries are grouped together.

SDGs matrix provides rich information for a powerful initial analysis on the complementary effects of different SDGs. For instance, SDGs matrix suggests that infrastructure development, industry and innovation (SDG 9) and women's empowerment (SGD 5) are positively correlated and can reinforce each other. Similarly, infrastructure development, industry and innovation can be mutually reinforcing with the eradication of poverty (SDG 1). In fact, resilient infrastructure, structural change (industrialisation) and innovation are also keys to achieve gender equality (SGD 5) and end poverty (SDG 1) for at least three reasons. First, as women are the primary caregiver of children and elderlies, particularly in SSA, fostering innovation and infrastructure provision can reduce the time women spend on domestic activities like fetching water, cooking, home maintenance (Fontana and Natali 2008). Second, infrastructure development, particularly road infrastructure and expansion of ICT are critical to expanding labour market opportunities for women in traditionally male-dominated sectors. This is indeed the case in countries like Ethiopia, Uganda, where road construction is expanding and women's participation in road work is increasing (UNDP 2016). Third, foreign and domestic investments in infrastructure have the potential to improve the earning of women through improving productivity that in turn promotes economic development, hence poverty reduction (Duflo 2012).

Most of the existing empirical evidence supports the hypothesis that gender equality stimulates initially economic development through the accumulation of human capital, improving productivity and efficiency (Alkire et al. 2013). Furthermore, gender empowerment policies have been shown to increase investment in children (Reggio 2011)—a key to achieve SGD1 and social mobility in the long run (SGD 10). Therefore, infrastructure development is a significant contributor to the achievement of SDG 1 (eradication of poverty), SDG 5 (gender equality and women empowerment) and in the long run SGD 10 (reduced inequality).

26.4 Method

We apply cluster analyses to both SDG indicators and countries to discover the interactions of relevant policy themes. While cluster analysis is typically used to identify country clusters at one level (Castellacci and Archibugi 2008; Europe 2010), we take a multiplex perspective and perform cluster analysis jointly on countries and SDG performance indicators at each SDG theme level, which is an innovative approach in policy performance analysis. Differing from regression analyses, which correlate two indicators, our analysis clusters countries which performed similarly at multiple SDG dimensions and related policy areas which countries tend to have a similar record as a group. Clustering at two

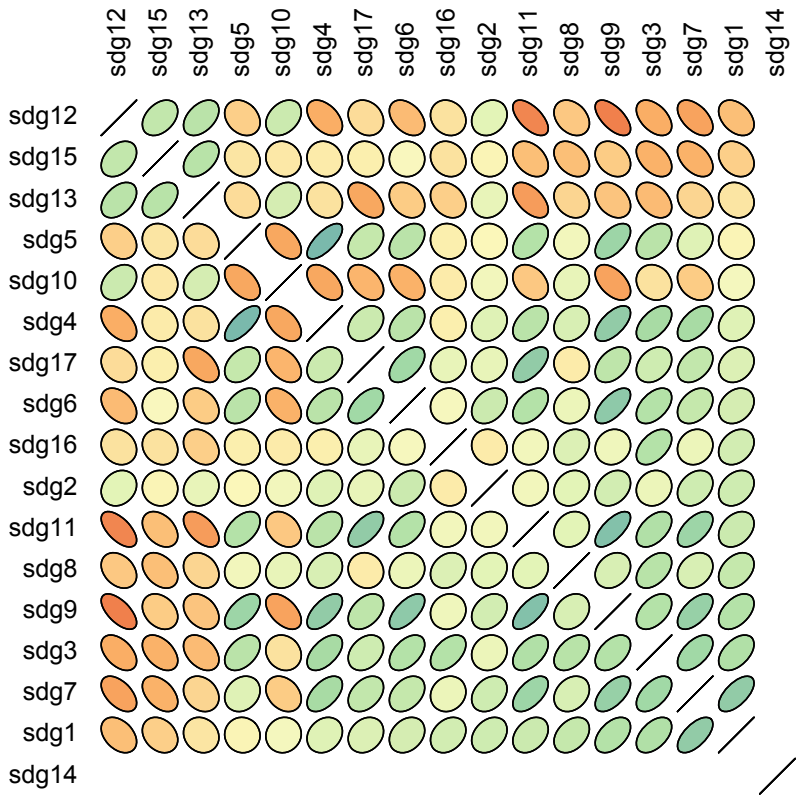

Fig. 26.1 SDGs Matrix (Authors' calculations using data from Sachs et al. (2017)). *Notes* denotes a stronger negative correlation than does, denotes a stronger positive correlation than does

dimensions (based on the normalised scores (0–100) from Sachs et al. (2017)) is more commanding than factor analysis, because it overcomes the orthogonality constraint among factors. By doing so, we are able to infer synthetic, latent constructs (policy mixes) from indicator clusters (Vigneau and Qannari 2003).

We also adopt a mixed-method approach by complementing our quantitative exploration with qualitative evidence. More specifically, once different country SDG clusters are identified, based on their relative performance in different relevant policy areas, we provide a qualitative synthesis for each SDG cluster (relevant policy mix) and construct a meta-theme at different levels. Based on the average performance of SSA countries, we further categorise each cluster as leaders, followers, moderate and modest performers. Given the multiplex approach, we use unsupervised hierarchical clustering, which does not predetermine the number of clusters.

Methodologically, there are different ways to form clusters. At least eight linkage methods exist in hierarchical clustering, namely Ward's, Ward's square, single, complete, average, McQuitty, median and centroid. Different distance measures exist too: Euclidean, maximum, absolute and Minkowski. To ensure that our results are sufficiently robust and not sensitive to the underlying algorithms, we took a data-driven approach and cross-checked our results based on different clustering methods and distance measures. We constructed a matrix that allows us to compare the consistency of results based on different clustering methods using different distance measures. Figure 26.2 presents this matrix based on the measure of absolute distance. We can observe that the method of complete linkage

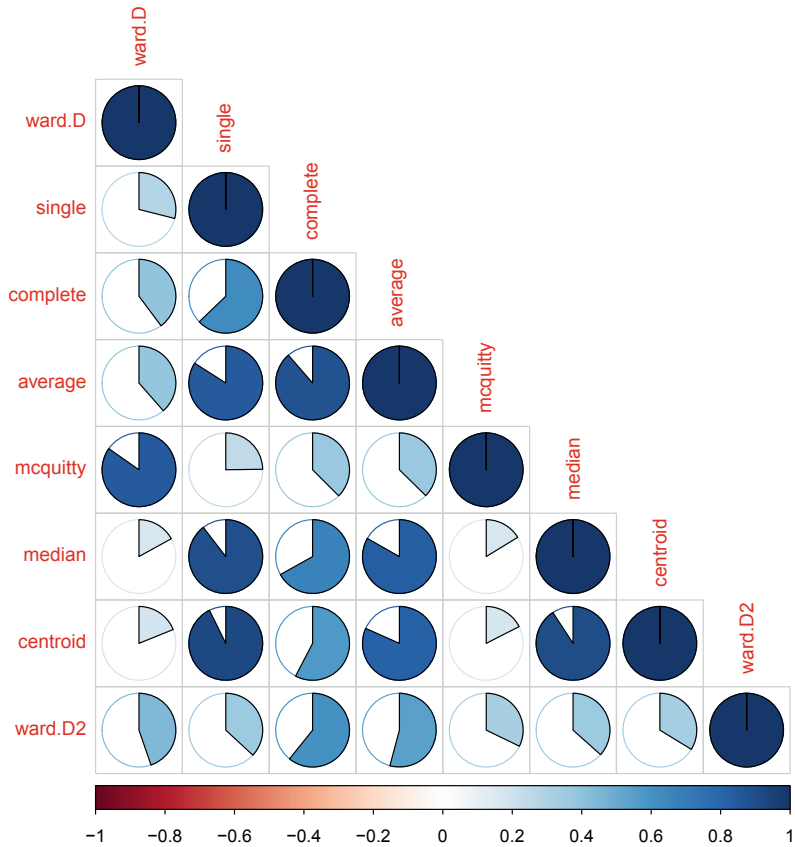

Fig. 26.2 Robustness check: Different linkage methods (17 SDGs) (Authors' calculations). *Notes* Circles in blue denote positive correlations between two measures. The size of the pie denotes the strength of correlation

yields results consistent with those based on other linkage methods.

Hierarchical clustering algorithm does not predetermine the number of clusters and is based on the similarities of performances. We propose that countries and SDGs within the same cluster can be grouped together to discuss policy issues related to development challenges, opportunities, threats under different policy mixes. Groupings based on the identified SDG country clusters facilitate learning as they allow countries with similar performance in a constructed policy mix to better contextualise their policy contents, design and performance. The groupings outline an agenda for how an international SDG conference can be designed and structured. In brief, actors related to an indicator under a policy sub-theme can be invited to participate in policy mix debates. Structure is quite flexible. Frontier countries can be gathered together to discuss how to advance a policy area. Or countries in the frontier and follower categories can exchange their experiences to facilitate policy learning. This process showcases the multiplex learning networks among SDGs (content) and SSA countries (structure).

26.5 Analysis

Figure 26.3 reports the results of unsupervised hierarchical clustering applied to the normalised average performance scores on each SDG for 39 SSA countries. Clusters are at both country and SDG level. From Fig 26.3, we identify 12 clusters of policy mix at SDG level: Cluster #i1 (SDG 2, 8); Cluster #i2 (SDG 3, 5); Cluster #i3 (SDG 5, 14); Cluster#i4 (SDG 4); Cluster#i5 (SDG 10); Cluster #i6 (SDG 6, 17); Cluster #i7 (SDG 16); Cluster #i8 (SDG 11); Cluster #i9

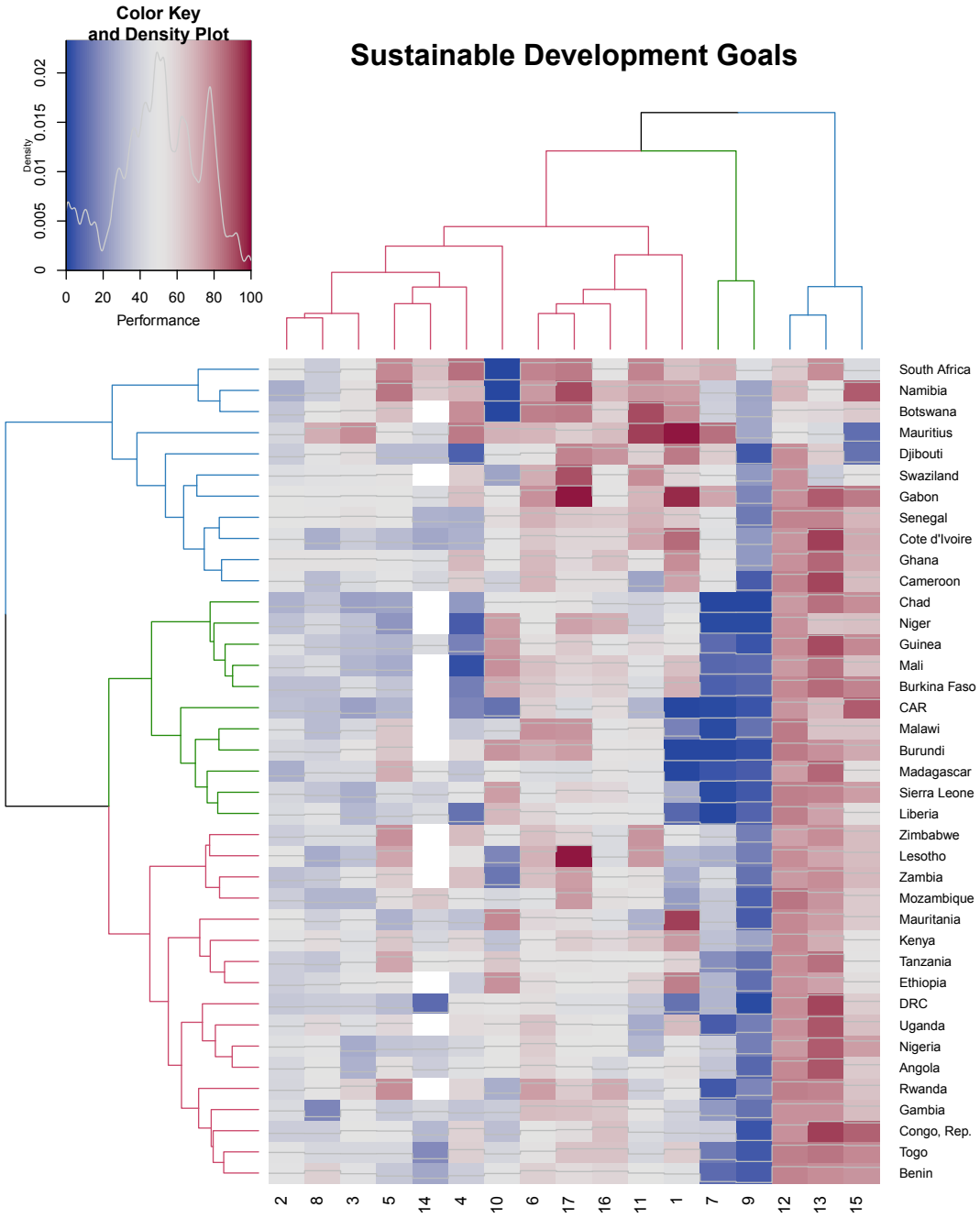

Fig. 26.3 Hierarchical clustering of average scores on SDGs in Sub-Saharan Africa (Authors' calculations). *Note* Hierarchical clustering; number of clusters is data-driven

(SDG 1); Cluster #i10 (SDG 7, 9); Cluster #i11 (SDG 12, 13); and Cluster #i12 (SDG 15).

We also observe that Cluster #i11 and Cluster#i12 group together at a higher level. This implies that in SSA, while Goal 12: Responsible Consumption and Production and Goal 13: Climate Action can be discussed together from a policy mix perspective (Cluster #i11), additional policies focussing on Goal 15: Life on Land can be added at a higher level to inspire policy innovation, which is proven to be more effective in achieving the stated SDGs than coupling with other potential policy mixes.

For instance, countries can promote sustainable land/forest management throughout the entire forest supply chain using land/forest certification systems as policy instruments. Certification systems may include small land/forest owners (e.g. family- and community-owned lands/forests) and should be designed in ways to balance different social, environmental, economic, ecological benefits, and simultaneously, backed by public and private agriculture or timber procurement policies. This ensures that the policy is tailored to local priorities and conditions, and is formulated in an inclusive process with the participation of all stakeholders.

Regarding Cluster#i6, we observe that initially two, and in proximate agglomeration five SDGs cluster together, and form another policy mix with Goal 6: Clean Water and Sanitation and Goal 17: Partnerships for the Goals; then Goal 16: Peace, Justice and Strong Institutions; and Goal 11: Sustainable Cities and Communities. Only about 15% of the population in SSA have access to water and soap for hand-washing (UN 2017). UN agencies warned that in as many as 90 countries around the world, progress towards basic sanitation is too slow, 'meaning they will not reach universal coverage by 2030' (UN 2017). For SSA, we argue that policy mixes in these four fields are urgent, yet partnerships for clean water and sanitation are at the core. While the relationship between Goal 6: Clean Water and Sanitation and Goal 11: Ensuring Sustainable Cities and Communities is straightforward, our finding implies that the region needs other policies designed or in action in the scope of Goal 16: Peace, Justice and Strong Institutions to address this issue holistically. This quadruple policy mix also forms the most relevant complementarity to the policies pertaining to tackling poverty in SSA (Cluster #i9). According to the World Health Organisation, every $1 spent on water and sanitation generates a return of $4 in saved time, increased productivity and reduced health costs in Africa (UN 2014). The private actor-backed policy showcased here would be the Replenish Africa Initiative programme (a 6-year, $30 million dollar commitment by the Coca-Cola Company (TCCC) in cooperation with business, civil society, NGOs, governments and more than 140 partners) which has reached over 1 million people with sustainable clean water access. Its objectives were to focus on making a strong, lasting community impact while supporting TCCC's water stewardship goals and helping Africa meet the UN Millennium Development Goal on water and sanitation (Coca Cola Company 2015).

Cluster #i1 is formed by two SDGs (Goal 2: Zero Hunger and Goal 8: Decent Work and Economic Growth) and, at a higher level, it couples with Goal 3: Good Health and Well-being. The policies targeting action in these policy themes should be discussed in an interrelated manner for simultaneous policy learning about this triple policy mix. One policy issue for this would be around the policy action against malnutrition, especially via innovative and sustainable market-based solutions throughout the entire food value chain (from 'seed to stomach'). Amsterdam Initiative against Malnutrition currently manages a portfolio of 10 projects which are being implemented in Kenya, Tanzania, South Africa, Nigeria, India, Malawi, Indonesia and Ethiopia, bringing SDG 2, 3 and 8 together (SDG Gateway 2017). This policy mix would consist of interventions for improving the value chain for local vegetables through innovative processing techniques; assisting the local production and retail distribution of micronutrient

powders; incentivising fortification of milk products; developing retail hubs for sourcing and selling of high quality vegetables; producing and distributing home fortification products; supporting quality and assurance labs; providing access to finance; and integrating nutrition into cash crop value chains (SDG Gateway 2017).

At first impression, the cluster of Goal 5: Gender Equality and Goal 14: Life below Water might seem odd, but the policy action targeting these Goals can have complementary effects. For instance, good practice policies to eliminate gender inequalities in fish value chains are highlighted by UN Food and Agriculture Organisation's (FAO) 2013 report. According to this report, women make up 47% of the world's 120 million people working in fisheries and outnumber men in both large-scale marine fisheries (66%) and small-scale inland fisheries (54%) (Dey de Pryck 2013). Especially, the case of Senegal highlights the underlying logic of this policy mix. According to UN Women (2015a, b), women in rural Senegal strive for the sustainable use of sea resources and play a crucial role in marine environments and fisheries economies. Our analysis also reveals that policy discussions on both Goals should be tied to Goal 4: Quality Education. Supporting our findings, the World Bank in its 'Gender and Fisheries and Aquaculture' report points out that the historical structural inequalities emanated from the comparatively low value attached to work done by women (Agricultural Development 2009). Women have only limited access to essential income-generating resources, e.g. ponds and capital, including education, new technology (World Bank 2009).

These two clusters (Goals 2, 3, 8 and Goals 5, 14, 4) constitute a broader framework which includes *Goal 10: Reduced Inequalities*. This meta-cluster can complement with Cluster#i6–i9 (clear water and sanitation/partnerships for the goals/peace, security and strong institutions/sustainable production and consumption) to tackle poverty (Goal 1).

The themes for the next policy mix are Goal 9: Industry, Innovation and Infrastructure and Goal 7: Affordable and Clean Energy. Supporting our finding, International Council for Science argues that 'building resilient infrastructure, promoting inclusive and sustainable industrialisation and fostering innovation are a necessary precondition for, and indivisible from, achieving the SDG 7 targets on access to energy services, increasing the share of renewables in the energy mix, and increasing energy efficiency' (Griggs et al. 2017). Two basic policy instruments here are providing financial, technical support to promote technological development and encouraging innovation through scientific research funding, which are supply-side policies or support to supply-side policies, both of which directly assist countries' energy industries.

In Fig. 26.3, we observe structurally low performance throughout SSA in both Goal 9 and Goal 7, so we analyse Goal 9 in-depth as it preconditions the achievement of Goal 7. Therefore, we elaborate on the policy sub-themes of SDG 9. Figure 26.4 illustrates how different countries and SDG-9 sub-indicators cluster together. It shows that the theme of Internet use (share of the population using Internet) initially clusters with performance in mobile communication (mobile broadband subscriptions per 100 inhabitants), we argue that these two sub-themes should be discussed together from a policy mix perspective and be learned about simultaneously in a multiplex learning setting. The same holds for the sub-themes of logistics performance (quality of trade, transport-related infrastructure) and overall infrastructure quality (telephony, transport, energy).

Freund and Weinhold (2004) find that the internet stimulates trade. The finding lends support to the claim that in SSA, 'technology and the internet are playing a pivotal role in bridging these infrastructural gaps' (World Economic Forum (WEF) 2017). The unexpected ways that the internet is transforming SSA extends even to energy sector. We argue that these two policy themes should also be given more attention, and be provided public research and development funds to encourage scientific research and experimental development. Yet even more importantly, government support should initially focus on improving the knowledge infrastructure (scientific and journal outputs) around various

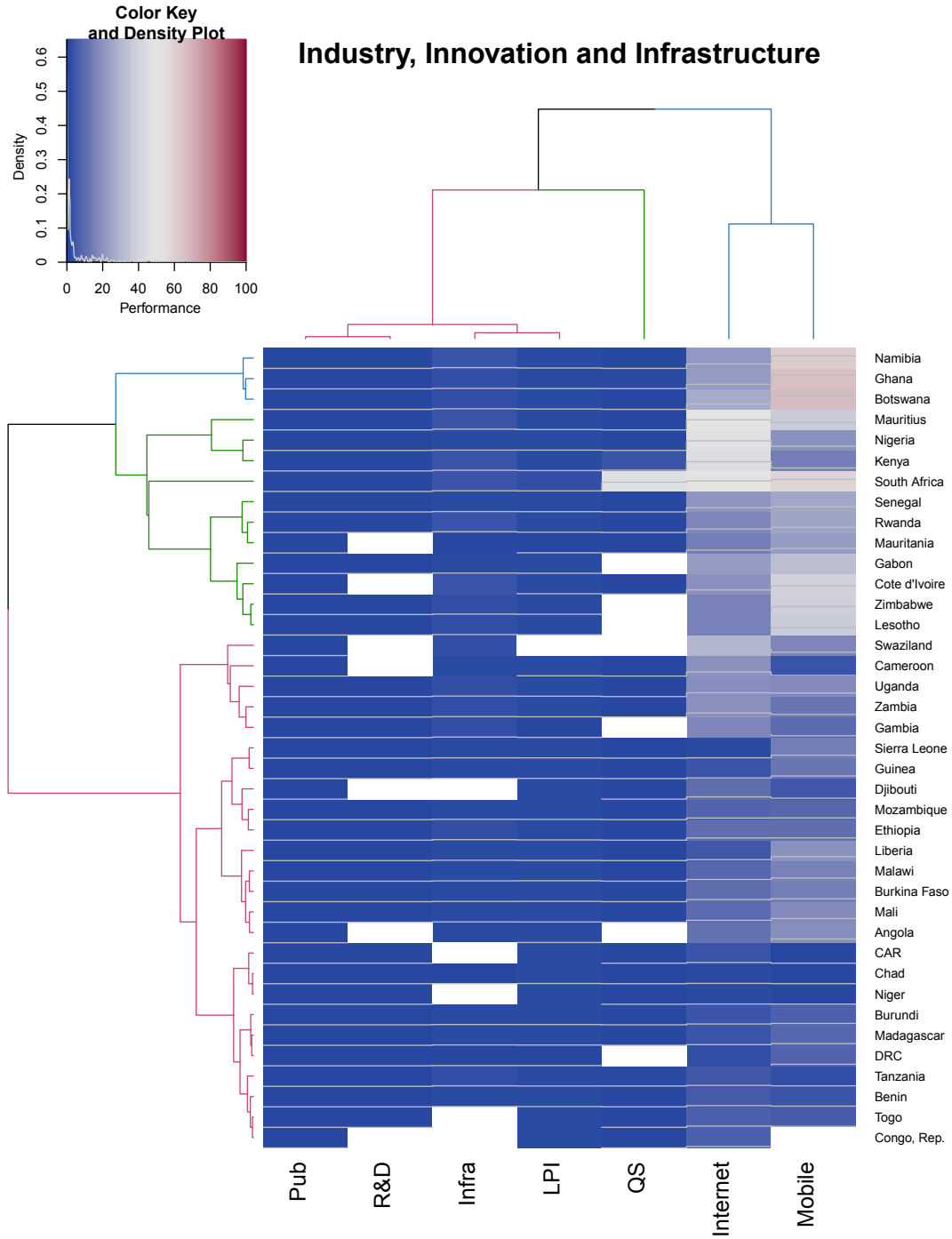

Fig. 26.4 SDG 9 Industry, Innovation, and Infrastructure (Authors' calculations based on the maximum distance measure for SDG-9 sub-indicators performance)

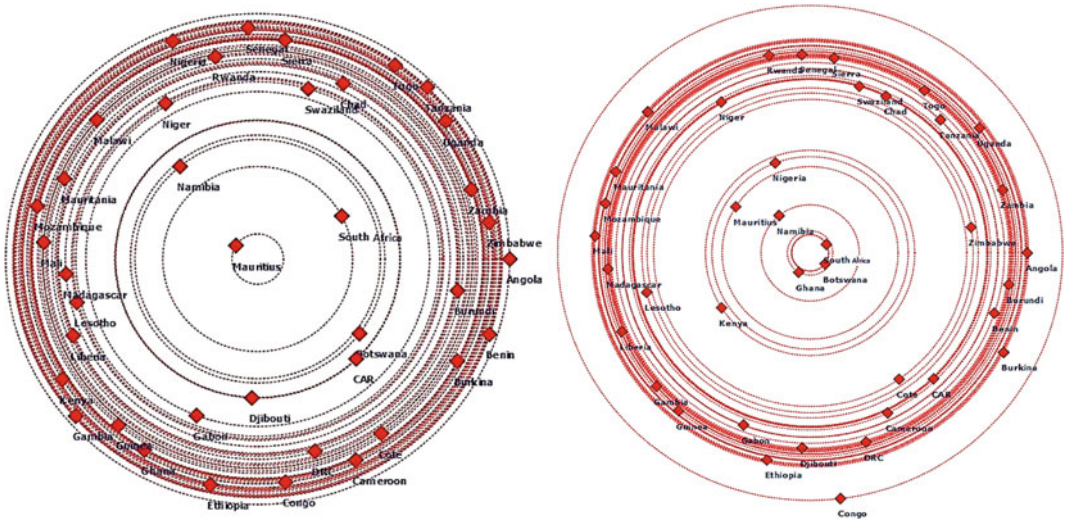

Fig. 26.5 Core, Semi-periphery, Periphery SDG performances in SSA (Authors' visualisation using SocNetV 2.2)
Notes Left: Overall SDG performance-Right: SDG 9 performance

sector-specific knowledge infrastructures (universities and research institutes). Figure 26.5 visualises the core, semi-peripheral, peripheral locations of SSA countries with respect to the distances among registered performance scores of each SSA country as a group in a network setting.

Figure 26.5, thus, shows that an SSA country can simultaneously be in different performance locations (e.g. core and semi-periphery, or periphery and core) in different performance layers of policy themes, which justifies the multiplex performance structure, and which, in turn, necessitates multiplex learning within each, and among actors of SSA countries. Table 26.1 presents final cluster centres for SDG 9 sub-indicators. It reports the similarity indices given by the cluster analysis. SSA countries performed similarly are grouped together. Sub-indicator groupings show the sub-themes in which multiplex learning under SDG 9 can happen.

Sub-indicator level performance differentials show that, for instance, Botswana is a moderate performer and a follower in overall infrastructure quality but not in Internet use. MediAfrica discusses this situation by stating that 'infrastructure is one thing, linking new media in viable ways to economic practices and people's everyday life is another' (MediAfrica 2015). Policy learning among these two sub-themes necessitates indicator-relevant actors, e.g. telecommunication companies, telecommunication regulatory agencies, government officials. For logistics and infrastructure, indicator-relevant actors include trade associations, transport associations, related companies, government officials to participate in policy learning, and the relevant policies are industry, innovation and infrastructure policies. For the case of science, technology and innovation policy, although Ethiopia, Kenya, Tanzania, Uganda, Mali and Senegal performed well, they were unable to translate their advantage in university research, scientific output or development institutions as South Africa does, a frontier in all four dimensions. Indicator-relevant actors for policy learning in this mix with a view on sector-specific knowledge infrastructure development are scientists, researchers, university administrators and government official, sector associations' representatives. The relevant policies are science, technology, innovation policy, and higher education policy.

Table 26.1 Performance differentials under SDG 9 in SSA

Status	Modest	Moderate/follower	Follower/moderate	Frontier
Indicators *Logistics and Infrastructure Quality*	12.8	23.5	37.2	73.1
	11.8	44.5	12.3	53.1
Industry, Innovation and Infrastructure Policy	Zimbabwe, Gabon, Angola, Congo DR, Mauritania, Senegal, Burundi, Djibouti, Madagascar, Mozambique, Cameroon, Congo R, Chad, Benin, Guinea, Liberia, Mali, Niger, Sierra Leone, Togo, Nigeria	Lesotho, Gambia, Swaziland, Rwanda Cote d'Ivoire, Ethiopia, Uganda, Zambia, CAR, Botswana, Namibia, Mauritius, Tanzania, Ghana, Kenya	Malawi Burkina Faso	South Africa
Indicators *Scientific Publications and Government R&D funds*	0.3	1.3	0.7	8.3
	0.9	7.5	16.3	20.0
Science, Technology, Innovation Policy	Zimbabwe, Angola, Congo DR, Mauritania, Burundi, Djibouti, Madagascar, Chad, Benin, Guinea, Liberia, Niger, Sierra Leone, Lesotho, Gambia, Rwanda, Cote d'Ivoire, CAR, Namibia, Malawi	Mozambique, Cameroon, Congo R, Togo Nigeria, Swaziland Zambia, Botswana Mauritius, Ghana, Burkina Faso	Gabon, Senegal, Mali, Ethiopia, Uganda, Tanzania, Kenya	South Africa
Indicators *Top 3 Universities Ranking*	0.0	2.6	5.1	51.2
Higher Education Policy and Science Policy	Mauritania, Senegal, Burundi, Djibouti, Madagascar, Mozambique, Cameroon, Congo DR, Chad, Benin, Guinea, Liberia, Mali, Niger, Sierra Leone, Togo, Nigeria, Rwanda, Cote d'Ivoire, Ethiopia, Uganda, Zambia, CAR, Botswana, Namibia, Mauritius, Malawi, Burkina Faso	Tanzania Ghana	Kenya	South Africa
Indicators *Internet Use and Mobile Subscriptions*	6.9	17.0	42.1	29.7
	9.0	31.3	21.5	63.4
Telecommunication and Infrastructure Policy	Burundi, Djibouti, Ethiopia, Madagascar, Mozambique, Malawi, Tanzania, Uganda, Zambia, Angola, CAR, Cameroon, Congo DR, Congo R, Chad, Benin, Burkina Faso, Guinea, Gambia, Liberia, Mali, Niger, Sierra Leone, Togo	Rwanda, Zimbabwe, Gabon, Lesotho, Cote d'Ivoire, Mauritania, Senegal,	Kenya Mauritius Swaziland Nigeria	Botswana Namibia South Africa Ghana

Note K-means clustering with 4 clusters, numbers denote final cluster centres

26.6 Conclusion

Around the world, research and education related to SDGs follow a scientific standard. This chapter brought forward an evidence-based approach to the design (content and structure) of international policy learning network for SSA countries. We stressed the central role of policy mixes, multiplex learning among policy themes and sub-themes among different indicator-relevant actors in SSA countries. Following our results and discussions, below we propose three main, emerging policy mix themes for an international conference agenda for SSA countries covering all SDGs.

International Conference Agenda:

Theme #1 Sustainable People: Inequality and Poverty

Inequality Reduction
Policy mix 1: Against Malnutrition, with Decent Work (SDG 2, 8, 3)
Policy mix 2: Gender Empowerment in Fisheries, Aquaculture and their Management (SDG 5, 14, 4)
Integrating the mixes (special attention to health and education)
Poverty Alleviation
Policy mix 3: Partnerships for Clean Water and Sanitation (SDG 17, 6)
Policy mix 4: Sustainable Peace—Strong Communities, Strong Institutions (SDG 16, 11)
Integrating the mixes (special attention to regional integration and security)

Theme #2 Sustainable Innovation

Eco-innovation
Policy mix 5: Innovation for Affordable and Clean Energy (SDG 7, 9)
Policy mixes for Innovation, Industry and Infrastructure (SDG 9)
Policy mix 9.1: Internet and Multi-level Trade and Transport
Policy mix 9.2: Mobile Communication for Banking, Health, Energy Infrastructures
Policy mix 9.3: Public R&D funds for actor and institute-based knowledge infrastructures
Integrating the mixes (special attention to higher education and specialised sectors of infrastructure)

Theme #3 Sustainable Planet

Sustainable Action
Policy mix 6: Sustainable Land/Forest Management for Climate Action (SDG 12, 13, 15)

Our future research is to design a global policy learning network for SDGs and open up a virtual interaction and learning space to bring this research into action by inviting actors from different parts of the world to engage in multiplex interactions under policy mixes towards the achievement of SDGs.

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