Edited by
Muna B. Ndulo · N'Dri T. Assié-Lumumba

Education and Development
Outcomes for Equality and Governance in Africa

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Education and Development

"This book makes an important contribution to research on education in relation to inequality, marginality and governance in Africa in the aftermath of the structural adjustment programs of the 1990s. The chapters are enriched by country case studies which delve into empirical evidence between educational policies and outcomes. Scholars and policy makers will benefit from the practical suggestions that come out of this work."

—Marja Hinfelaar, *Director of Research and Programs, Southern African Institute for Policy and Research (SAIPAR)*

"This book is both insightful and provocative. Written by economists, educators and policy analysts, the book argues that in an unequal society, education, on its own, cannot bring about good governance and equality. To transform society, education must be used more strategically as a tool of public policy. Marginalized groups will require targeted support to benefit from education policy initiatives for raising productivity, and/or enhancing skills. I recommend the book for its breadth of coverage and lucidity of argument."

—Steve Kayizzi-Mugerwa, *Former Acting Vice President, Africa Development Bank*

"Anyone involved in the development of human capital in Africa will treasure this book. The volume brings together three essential elements for the continent's transformation in the 21 century—policies prioritizing education for skills development over ownership of natural resources; taking advantage of the continent's youthful population to reap the demographic dividend for efficient management of economic and social resources to increase competitiveness in the world economy; participation in governance for eradicating poverty, promoting human rights, and securing peace and stability. The chapters challenge us to think critically about the iron triangle of education—access, quality and cost. And if you are in any way concerned with the future of Africa's development trajectory, you owe it to yourself to read this book."

—Yaw Oheneba-Sakyi, *Founding Dean, School of Continuing Education at the University of Ghana*

"This book represents a significant contribution to the study of education in Africa. It convincingly connects education to economic development and growth. The book takes a multidisciplinary approach to the issues and touches on political economy, governance, economic development, vulnerability and equity. It has a cross generational take on education spanning early childhood to tertiary education. It gives voice to very important segments of society such as girls, youth and teachers."

—Malak Zaalouk, *Professor of Practice, American University in Cairo*

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Acknowledgments

This book is the result of a symposium entitled, "Education and the Development of Human Capital: Outcomes for Equality and Governance in Africa," held at Cornell University, April 17–18, 2015, and sponsored by the Institute for African Development, Cornell University, in collaboration with the Mario Einaudi Center for International Studies and Department of Development Sociology, Cornell University. The symposium was aimed at examining education and development of human capital in Africa, with emphasis on outcomes that promote equality and good governance. It hoped to contribute to policymaking by those involved in education in Africa. The book is a collection of the papers presented at the conference. Each chapter is written by a person with considerable knowledge of the area on which they are writing. The symposium attracted academics in various disciplines including economists, educators, and policy analysts. The varied backgrounds of the authors reflects the symposium's interdisciplinary approach.

The symposium could not have been held and the book published without the help of many people. In particular, I would like to thank Jackie Sayegh and Evangeline Ray, who did excellent work in organizing the symposium and worked tirelessly to prepare the manuscript for publication. I also thank Cosmas Emeziem and Leah Marx for helping with the preparation of the manuscript for publication, and the copy editors, Mike Sola and Patricia Mason for working diligently to give the manuscript its final shape.

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Acronyms and Abbreviations

AATF	Africa Agriculture Technology Foundation
ACUP	Catalan Association of Public Universities
ADB	African Development Bank
AERC	African Economic Research Consortium
AESIF	Agricultural Education and Skills Improvement Framework
AET	Agricultural Education Training
AFAAS	African Forum for Agricultural Advisory Services
AfDB	African Development Bank
AGRA	Association for Green Revolution in Africa
AHC-STAFF	Africa Human Capital in Science, Technology and Agripreneurship for Food Security Framework
AIDS	Acquired Immune Deficiency Syndrome
AIS	Agricultural Innovation Systems
ANAFE	African Network for Agriculture, Agroforestry and Natural Resources Education
ARUA	African Research Universities Alliance
ASSAf	Academy of Sciences of South Africa
ATVET	Agricultural Technical and Vocational Education and Training
AU	African Union
AUC	Africa Union Commission
AWARD	African Women in Agricultural Research and Development
BECA	Biosciences Eastern and Central Africa
BL	Barro & Lee
BRICS	Brazil Russia India China and South Africa
CAADP	Comprehensive Africa Agriculture Development Program
CARTA	Consortium for Advanced Research Training in Africa

CEP	Certificat d'Etudes Primaires, (The Primary-School Exit National Exam)
CFA franc	Communauté Financière *Africaine* (African Financial Community)
CGIAR	Formerly, Consultative Group on International Agricultural Research
CHEA	Conference on Higher Education in Agriculture in Africa
CMAAE	Collaborative Masters of Agricultural and Applied Economics
CODESRIA	Council for the Development of Social Science Research in Africa
CPA	Consolidated Plan of Action
CSIR	Council for Scientific and Industrial Research
DFID	Department of Foreign and International Development
DHS	Demographic and Health Survey
DIME	Development Impact Evaluation
DRC	Democratic Republic of Congo
DST	Department of Science and Technology,
EACI	Education for African Crop Improvement
EARTH	Escuela de Agricultura de la Region Tropical Humeda
EFA	Education for All
EMICoV	Integrated Modular Survey of Household Living Conditions
ESDA	Japan's Education for Sustainable Development of Africa
FAAP	Forum for Agricultural Research and Productivity
FAO	Food and Agricultural Organization of the United Nations
FPE	Free Primary Education
GCHERA	Global Confederation of Higher Education Associations for Agricultural and Life Sciences
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GFAR	Global Forum for Agricultural Research
HERANA	Higher Education Research and Advocacy Network in Africa
HIV	Human Immune Virus
IAU	International Association of Universities
ILO	International Labour Organization
IMF	International Monetary Fund
INSAE	National Institute of Statistics and Economic Analysis in Benin
LDCs	Least Developed Countries
MDGs	Millennium Development Goals
NARS	National Agricultural Research Systems
NEPAD	New Economic Partnership for Africa
NGOs	Nongovernmental Organizations
NRF	National Research Foundation

NYU	New York University
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
OVC	Orphans and Vulnerable Children
PAFO	Pan-African Farmers' Organization
PEARL	Program for Emerging Agricultural Research Leaders
RISE	Regional Initiative in Science and Education
RUFORUM	Regional Universities–Forum for Capacity Building in Agriculture
S3A	Science Agenda for African Agriculture
SAALSDA	South African Agricultural and Life Sciences Deans Association
SADC	Southern African Development Community
SAP	Structural Adjustment Programs
SARUA	Southern African Regional Universities Association
SASAC	Southern African Systems Analysis Centre
SAU	State Agricultural University
SDGs	Sustainable Development Goals
SHF	Smallholder Farmer
SPL	Social Protection and Labour
SROs	Subregional Agricultural Research Organizations
STI	Science Technology and Innovation
STISA	Science Technology and Innovation Strategy for Africa
TAE	Tertiary Agricultural Education
TEAM-Africa	Tertiary Education for Agriculture Mechanism in Africa
UN	United Nations
UNCRC	United Nations Convention on the Rights of the Child
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational and Scientific Organization
UNFPA	United Nation Population Fund
UNICEF	United Nations Children's Emergency Fund
USAID	United States Agency for International Development
WB	World Bank
WDI	World Development Indicators
WEF	World Economic Forum
WERK	Women Educational Researchers of Kenya

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CHAPTER 1

Introduction: Education and Human Capital, Current Debates, and Policy Imperatives

Muna B. Ndulo and N'Dri T. Assié-Lumumba

The genesis of this book is a symposium, organized by the Institute for African Development (IAD) and held at Cornell University from April 17–18, 2015. The symposium had as its theme: *Education and Development of Human Capital: Outcomes for Equality and Governance in Africa*. The symposium examined education and development of human capital in Africa, with emphasis on outcomes that promote equality and good governance. Presenters at the symposium sought to identify challenges facing the education sector in Africa, and those policies which support inclusive and sustainable development. Education, in every sense, is one of the fundamental factors of development and growth. No country can achieve sustainable economic development without substantial investment in human capital. It enriches peoples' understanding of themselves and the

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world, and it improves the quality of their lives and leads to broad social benefits for individuals as well as society.

The title of the 2000 World Bank Report asked the question, *Can Africa Claim the 21st Century?* (World Bank 2000). Contrary to general perceptions in many African states that if only "we had oil," we would be well on the road to development, the answer to this question is not predicated on the ownership of natural resources, rather on such factors as education and skills development. Owning natural resources has not yielded positive transformation of an African economy. Instead, many resource-rich countries have been negatively impacted by what is termed the "resource curse." The critical factor in development of Africa is the development of education and skills. The perceived African demographic dividend is predicated on developing a competitive skilled work force. It is estimated that Africa will, in 2050, have more people of working age than in China. For the population dividend to be an effective asset for Africa, it will have to be well educated, healthy, and skilled. If the population is not educated and skilled, the demographic dividend could turn out to be a mirage and could very well become a huge disaster, resulting in increased poverty, hunger, and disease.

Whatever misgivings Africans might have had about European education introduced in the context of colonial rule, by the time African countries started to acquire their independence in the 1950s and 1960s, there was a consensus across the continent about the merit of human capital theory. It stipulated a positive and linear correlation between education and socioeconomic attainment of individuals, as well as between the aggregate levels of education of nations and broader societal/national development. In May 1961, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Economic Commission for Africa (UNECA) convened a historic conference of African states. The theme of the conference, which was held in Addis Ababa, Ethiopia, in May 1961, was "The Development of Education in Africa" (UNESCO and UNECA 1961). The overwhelming recognition of formal education at that conference as "the priority of all priorities" led to the commitment of African governments, policymakers, and education decision-makers to support the policy of achieving universal primary education by 1980, and to increasing transition rates between the primary and secondary levels, on the one hand, and between the secondary and higher education levels, on the other. The conference, therefore, had set the tone of education in independent Africa in line with the self-reliant and capacity development dreams of the pre-independence struggles.

Although substantial gains were made, in quantitative terms, during the post-independence era, the optimistic outlook of socioeconomic development of the 1960s and 1970s and the Addis Ababa goals were not reached when severe economic problems and the debt crisis of the 1980s was experienced by many African countries. To emerge from debt, the African countries adopted debt management policies, including debt forgiveness agreements with the Paris Club, which were conditioned on the implementation of Structural Adjustment Programs (SAP) designed by the International Monetary Fund (IMF) and the World Bank.

Of particular significance to education is that some of the debt management conditions required reduced funding for education and other social services, resulting in a need for the introduction of user fees for accessing educational and health services. Consequently, the structural adjustment era reversed many of the gains that were made in the immediate post-independence era. By that same token, the severe economic crisis, debt burden, and the introduction of user fees—even at the basic levels of education—led to stagnation and decline of enrollment at all levels of education (Lumumba-Kasongo and Kennett 1992; Assié-Lumumba and Lumumba-Kasongo 1996; Mkandawire and Soludo 1999).

Seeing that the era of structural adjustment reversed development and undermined the achievements of the post-independence era, there were renewed calls for the restoration of funding for education. These renewed calls were to restore education to its classical position, as the ultimate means for individual socioeconomic attainment and for national development. The calls were reinforced by the assessments about the immediate-, medium- and long-term consequences of the policies of the SAPs carried throughout Africa. Assessments revealed that the cost of curtailing funding to education was much higher than the actual cost of the supply of education. Subsequently, a series of meetings and global engagements, sponsored by several international institutions, including the World Bank, United Nations Development Program (UNDP), UNESCO, and the United Nations Children's Fund (UNICEF) took place. In particular, the 1990 International Congress on Educational Management and Development, held in Mexico City, and the World Education Forum of 2000, in Dakar, reaffirmed the role of education in development globally. This role was again reiterated in the Millennium Development Goals (MDGs). It is interesting that even the World Bank, which played a critical part in the previous policies, reversed its position, and in collaboration with UNESCO, commissioned the Task Force that produced a report in

2000: *Higher Education in Developing Countries: Peril or Promise* (Task Force on Higher Education and Society 2000). Thus, there is once more a buildup of consensus on the importance of education in the global development agenda (Hallak 1990; UNESCO 1998).

This may well explain why the African Development Bank (AfDB) in its 2014 *Africa Economic Outlook Report*, observed that, generally, Africa had made substantial progress in human development, as poverty levels had been falling, incomes are rising, and educational and health indicators were showing considerable improvement. The report also pointed out that the Human Development Index was showing a 1.5 percent annual growth. Indeed, the report indicated that 15 African countries were considered to have attained medium-to-very-high human development levels. Despite these data, it must be noted that there exists a significant number of countries in which income inequality is widening, and educational and health indicators are deteriorating. Thus, it is critical that there is more progress to be made with respect to gender inclusion and equality, access to education, health care, and environmental sustainability.

Therefore, there is no denying that since Africa lacks human capital and the requisite skills for rapid development, it needs to invest more in education and human capital development. This is the surest way to guarantee growth and enhance the living standards for its entire people. Moreso, investment in education and human capital is essential to ensuring the improvements necessary to make African countries competitive in the world economy, and thereby, create jobs for Africans. Thus, the role of education in reducing and eventually eradicating poverty, increasing economic competitiveness, and securing peace and stability cannot be overemphasized. Inadequate education also has a negative impact on citizens' ability to participate in the country's governance. The World Bank defines good governance as "the manner in which power is exercised in the management of a country's economic and social resources for development, is an important factor in eradicating poverty, creating employment, promoting equality, and in the adoption of policies that foster inclusiveness, human rights, and improved livelihoods" (World Bank 1992, 1).

Pursuant to the foregoing, the symposium deliberated on how education, the development of skills and human capital—for both men and women—could be enhanced. It also focused on improving the outcomes of governance, as a necessary corollary to economic development and human capital advancement. The subthemes of the symposium explored the quality of education in Africa, the implications of the skills gap, the

relationship between economic conditions and violence; and the relationship between education and electoral behavior—among other topics. Inequality and ineffective policies are often blamed for the poor relationship between economic growth and human development, but data shows that links between economic growth, inequality, and human development are less robust than often assumed. A pattern of inclusive growth is essential to poverty reduction in sub-Saharan Africa. The design and implementation of policies and institutions conducive to inclusive growth require a better understanding of the relationships linking growth, inequality, and poverty. The symposium critically examined a variety of issues, such as identifying strategies to ensure that growth translated into improved livelihoods for people, transformative policies that empower the poor and landless, and educational policies that build the capacity of youth and other disadvantaged communities, thereby equipping them with a set of tools and skills to effectively partake in the economy. Going further, the symposium highlighted topics such as the eradication of poverty and acknowledged that a poverty eradication project involves not only the government, but civil society and the private sector as well.

The chapters in this volume challenge us to think critically about access to education, education curricula, education policies, and quality of education in Africa. As noted here, over the past 25 years, countries in Africa have made substantive progress in primary school access. Despite these gains, many young people who attend school are not acquiring the basic skills necessary to thrive in a diverse and changing labor market. The vast majority of public educational institutions are overcrowded due to limited facilities. African countries have been rapidly setting up universities without adequate infrastructure. They have been upgrading polytechnics and technical colleges to the detriment of educational standards. Because growth, development, and poverty reduction depend on the knowledge and skills that people acquire, and not the number of years that they sit in a classroom, Africa must seek to transform its education system from education for all to learning for all. Quality needs to be the focus of education investments, with learning as the true test of an effective education system. The human mind makes possible all development achievements, from health advances and agricultural innovations to efficient public administration and private sector growth.

In Chap. 2, Teboho Moja discusses a broad range of issues around education in Africa. She focuses on education capacity and skills as determinants in economic development and draws attention to the differences

between equity and equality, two interrelated and yet distinct concepts. She notes that inequality at both continental and national levels—in access to education and in the limited quality of education provided to learners—have been with us for several decades. She argues that the global disparities experienced among countries have a deep-rooted history. The disparities are linked to the historical loss of sovereignty and colonial rule and domination. This, in her view, is what fuels the current global inequality and widens the gaps in wealth and income today, both across and within national borders. Moja examines the question as to whether enough is being done to redress those past injustices, and suggests that the world needs to continue to explore ways of narrowing the gap in accessing educational opportunities. She argues that, beyond raising questions, discussing the issues, and making recommendations, more transformative models are needed to achieve equality and equity in education.

In Chap. 3, Eloundou-Enyegue, Giroux, and Tenikue examine the implications of education for economic inequality between countries. They argue that African countries have made significant progress in the educational sector, and the gap between countries in terms of educational performance is narrowing. The big question is whether this progress is translating into a narrowing of the economic gaps between countries. They hypothesize that countries should converge economically, if they begin to converge educationally. Education is endorsed as the best investment in development and the greatest equalizer, with benefits accruing to both the individual and to nations. They argue that this endorsement rests on incomplete evidence and critique the focus on national studies to demonstrate support for the positive impact of education on equality. Such studies fail to examine inequality between countries. In this chapter, they seek to explain trends in income inequality based on multiple components, which include quantity and quality of schooling. The authors argue that convergence in education does not mean convergence in economic performance. Economic convergence need not follow educational convergence. They address the question whether education is an economic equalizer, and if it is, which aspects (quantity vs. quality) are most influential. Despite the fact that they use limited data, the chapter brings forth some evidence-based insights that underscore the potential contributions of education to economic convergence of African countries.

Somasse, in Chap. 4, discusses free education, schooling outcomes, and wages in Benin. This is a country-specific study. It examines a nation that adopted a policy of free education for primary and preschool education in

all public schools. The Gini coefficient of both per capita consumption and school-age youth enrollment is high, with the cost of education considered the most prohibitive factor. The interface of gender and resources indicate the lowest enrollment for girls affected by poverty. Somasse investigates how differences in education outcomes drive income inequality and the relationship of education to growth, poverty reduction, and the attainment of key developmental goals. Overall, the free primary education policy and the improved supply of education has increased enrollment significantly and will increase the education attainment of the population. Gender and regional gaps in education have also improved substantially over time. Understanding the changes in the distribution of education outcomes is important in designing policies to achieve development goals. Findings indicate a relationship between higher education attainment and higher average wages, although the simulation also showed that the declining inequality of schooling, particularly at the primary level, led to insignificant change in wage inequality. The author suggests that the slow change or persistent inequality maybe attributable to low returns on primary education or national socio-political dynamics, such as the negotiating power of the labor unions and effect of collective bargaining, which may blur or even weaken the relationship between education and earnings. At the higher levels, however, reduction in unequal access to education seems to reduce earnings inequality.

In Chap. 5, Swanepoel, Stroebel, and Mentz take on the issue of education and agriculture and food production. The authors observe that Africa is the most food insecure continent, with relatively low levels of agricultural productivity, low rural incomes, high rates of malnutrition, and a significantly declining food trade balance and the fastest growing population. Ironically, Africa has sufficient land, water, and human resources to contribute significantly to the world's food balance sheet. Agriculture and the food sector present a significant opportunity for employment and wealth creation. To date, much of Africa's impressive recent economic growth has come from minerals and energy, with little impact on employment and improvement of living conditions of the rural majority. The authors argue that education can play a major role in driving agriculture-led economic and social transformation in Africa. Agricultural production can lead the positive synergy of "agriculture and agro food industries" as a vibrant economic sector for employment and subsequent economic advancement. To do this, African governments would need to increase their investment in agriculture by committing to the 10 percent budget

target set by the AU 2003 Maputo Declaration on Agriculture and Food Security and vigorously pursue the development of the necessary human resources for sector growth.

In Chap. 6, Beoku-Betts discusses the challenges and outcomes of women academic scientists and their role in development. She argues that, as science is an area of critical importance to development, that for women "to claim an equal role as partners in the global market of the 21st century," they must develop their scientific knowledge and transform it into "wealth and social good." African policymakers agree on the importance of science in development. However, the observable level of investment in science and technology, and research and development in Africa remains significantly low by global standards. Universities provide an important institutional medium for the effective development of science and technology through teaching and research. The training and employment of women constitutes an essential component of the resources. Discourse on science training often marginalizes the place of women in science and technology. Beoku-Betts argues that women bring positive understanding about the broader social purpose of science and its ability to transform the quality of life in society. Their perspectives on the role of indigenous scientific knowledge in their society and their involvement in civil society development initiatives that popularize science and increase awareness of science among the youth, especially girls, is an imperative to national development.

In Chap. 7, Shani discusses education and human capital development among geographically isolated regions and marginalized groups in Kenya. In the case of Kenya, the arid and semiarid lands and nomadic communities have their idiosyncrasies that defy designed plans. She discusses education among a poor rural Maasai community. The majority of the members of the community could not educate their children beyond elementary school. Yet, they live near modern tourist facilities, which are not available to them. These communities lag behind their counterparts, who live in much more affluent and better served communities. More significantly, gender inequality is rampant in educational attainment. The chapter looks at the education of girls from marginalized groups and offers recommendations for meeting their needs. There is a need for adaptation in order to respond to the constraints of the cultural, social, and geographical environments faced by teachers and learners. These situations require multifaceted, specific, and unique approaches, including such measures as mobile schools for nomadic groups, increasing security, and improving health facilities in order to improve the production of human capital and

ensure quality education for children from disadvantaged regions and communities.

In Chap. 8, Pillay critically examines education, inclusion, and development for orphans and vulnerable children. In doing this, he addresses an important dimension of education—the question of adopting policies that are inclusive of orphans and other vulnerable children. The author points out that there is a growing number of orphans because of the HIV/AIDS pandemic. These groups require services beyond the conventional and minimally equipped schools. The chapter argues that early education, inclusion, and development for orphans and vulnerable children is crucial for good governance. He points out that this is an important segment of the population in many African countries, largely because of the HIV/AIDS pandemic. Orphans and vulnerable children are at a greater risk of dropping out of school. This poses an economic and social threat to the development of African countries. Pillay argues that it is essential to integrate knowledge about education and care for orphans and vulnerable children in their early years of school in order to promote their optimal development. After noting that many African governments do not spend much money on early childhood education, the author seeks to show why they should invest in early childhood education. He argues that their inclusion is a sine qua non for broader socioeconomic development.

In Chap. 9, Riggan looks at Eritrea's 2003 educational policy in which the government mandated skills-centered education. She illustrates the gap between learning outcomes and assumed corresponding and appropriate curriculum and pedagogy. She uses the case of Eritrea to illustrate the disconnections between policymakers' visions of education for human capital development and the pragmatics of actually educating students in often underfunded and under-resourced African schools. She explores this case in order to argue for human capital programs that emerge from grassroots teachers' expertise and respond to the exigencies of local communities and local economies that support teachers, to ensure that students learn, despite challenging circumstances in the schools. As she notes, while a great deal of attention has been paid to resource scarcity in schools in Africa, little attention has been paid to the resiliency, creativity, and knowledge of the teachers who are running these schools. Riggan argues that it is critically important that educators and policymakers consider the significant experiences of the teachers to maximize their competencies and makes the case for using teacher expertise in these schools in order to better design and implement the kinds of reforms needed. Otherwise, we will

continue to see that reforms oriented toward developing human capital operate quite differently from the ways in which their architects intended.

In Chap. 10, Stroebel, Swanepoel, and Mentz examine the significance of doctoral education and training for development in Africa. In this chapter, the training of students at the highest level of formal education, doctoral studies, is viewed as crucial to the development of Africa. This is a classical human capital argument of linear and positive correlation between education and the socioeconomic advancement of both individuals, nation-states, and society. The authors point out that, in recent years, Africa's growth rates have risen. Its world trade has increased, secondary education enrollment has increased, and the middle class is growing. The other side of the story, however, is that Africa is home to 14 of the least competitive countries in the world and development rates are very uneven across countries. Approximately one-third of the world's poor, who live in extreme poverty, are found in this region. At the same time, Africa is faced with circumstances that are both a potential asset and a risk. The continent has a youthful workforce. Youthful population of this nature is associated with both the opportunity for rapid economic growth as well as with the risk of high levels of conflict and unrest. To avert this outcome, it will be imperative to create jobs at a faster rate than population growth. Africa's ability to establish itself as a competitive knowledge economy will depend on the continent's ability to transform its contribution to global scientific output. The PhD is a pinnacle qualification broadening the frontiers of knowledge, enabling job creation by equipping graduates to work in multiple contexts, and establishing a base for an innovative and entrepreneurial knowledge society.

Finally, King, in Chap. 11, analyzes the link between education and employment. She examines the link by taking Kenya as a case study. In sub-Saharan Africa, 43 percent of the population is under 15, and the absolute number of youth is growing faster than anywhere in the world. Some studies see this as a cause of concern. Yet, both academic and policy literature present an alternative view, framing the unprecedented numbers of youth today as a dichotomy—a disaster or a dividend, with the outcome depending on global, national, and local policies and programs. King offers a possible explanation between, on one hand, the tremendous faith and commitment to education and employment programs aimed at youth and peacebuilding, and on the other, disappointing results. She addresses this issue through a case study of the youth aspirations in Nairobi Kenya.

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CHAPTER 2

Unpacking the Rhetorical Equity for Development: Is Equity Achievable in an Unequal Society?

Teboho Moja

Discourses around education in Africa raise a broad range of questions and issues. What is disturbing is that there is a lot of talking and very little action: is it not time to move away from the descriptions of issues to actions, toward alternative solutions needed and to the implementation of those recommendations? This chapter seeks to address equity issues and what it means to strive to reach equity in an unequal world. My focus is higher education in Africa, with some reference to other aspects of the education system. Some of the issues I raise are also applicable in the other sectors of education.

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Global Inequity

The starting point should be the acknowledgment of existing global inequities, and inequities between African countries and within individual societies.

We live in a world where disparities are continuously widening in all spheres of life—education, health, wealth, and human rights—at both a continental and national level. The global disparities experienced today among countries have a deep-rooted history, as illustrated in studies such as that by Shahid Alam (2006), who examined the pattern of global inequities alongside their timing and evolution among regions of the world. He explained global inequity as linked to the historical loss of sovereignty, imperialistic control of economies, and historical reduction to colonies and near colonies during the first decades of the nineteenth century. He further explained that leading to the global dominance during the Industrial Revolution was the discovery of alternative energy technology. This history fuels the current global dominance and widens the gaps in wealth and income today, both across and within national borders. Given this historical context, do regions that were dominated and colonized stand a chance to catch up and be equal players in the global economy? Is there global redress to those past injustices that created global inequities?

Studies have shown that education drives and supports economic development (Drèze and Sen 1995; Klasen 2002). Therefore, the question is how can education in the developing world help those countries catch up, despite disparities in education systems of the world and disparities within countries in terms of educational access and opportunity? Education is not merely for economic development, it is a basic human right. Many declarations have been made at the global level about the need for universal access to education, with the not so recent Education for All (EFA) call first made in 1990 at the UNESCO conference held in Jomtiem, Thailand. This call later metamorphosed to become part of the United Nations agenda for the Millennium Development Goals (MDGs), which were set to be achieved by and expired in 2015. Currently the call is for the achievement of Sustainable Development Goals (SDGs) by 2030. The report of the 15-year MDG project indicates that, despite some progress toward achieving the goals, they were not fully realized. For example, MDG2 aimed to achieve universal primary education, particularly for girls, ethnic minorities, and marginalized children. However, by the time the MDGs expired, progress toward this goal indicated that 52 percent of the

countries achieved the goal, while 38 percent remained far from achieving it. This translates to 100 million children in 2015, a disturbing fact in light of the goal's mission for universal education (UNESCO 2015). MDG3 sought to ensure equal access to learning and life skills for youth and adults. Similar to the outcome previously stated, only 46 percent of countries reached universal lower secondary enrollment. What about those millions that are still not accessing education? What about their potential contribution to sustainable development that will be lost without education? Whose responsibility is it for them to access education? The budget for bridging that gap was estimated to be $22 billion USD in additional funding from the international community and donors. With commitment to development and assistance from the donor world, the goals of providing education to the majority could be realized.

In a globalizing economy, the purpose of education has shifted from the individual to the system, signaled by a shift in focus from education for personal development to education for supporting national economic growth. Today, education is viewed as necessary to support development agendas. Education reform efforts often have the main goal of strengthening economic development to more effectively compete in the global economy. As Manuel Castells put it, we are all in, part of, or aspire to be part of the global economy (Muller et al. 2001). The MDGs listed education as a tool for development and poverty alleviation. In Africa, policymakers hope that reforming their education systems can drive development to make their nations competitive in the global economy. This is happening despite the fact that the region is lagging behind others in offering education to all. The problem is that the role of education is often expressed mainly in economic development terms and less in terms of social development, a major issue on the African continent. Would improved access to education in Africa contribute to social development and help improve Africa's chance of competing with other regions whose economies are further advanced? If so, how do African nations begin to address inequities within the continent, when countries with more advanced economics still struggle with the attainment of equity? For example, a country like the United States, regarded as advanced economically, still grapples with inequity issues in education and in providing access to quality education opportunities to all members of society.

Referred to in the past as "global apartheid," inequities among countries are a major concern (Moja 2003). Power and control are concentrated in the hands of a powerful few, with their actions having

disproportionate effects on the world. In higher education, for instance, global rankings dominate the perceived worth of an institution of higher learning. The rankings are loved by those who appear at the top and despised by those who feature at the bottom. For instance, one measure for the rankings is international publications. At the same time, we know that ownership of databases and publishing houses, among other necessary parts of the publication process, are concentrated in Europe and the United States. The powerful few are not located in Africa or in the developing world, meaning research by African scholars or about the African continent is often published by Western scholars, jointly with Western Scholars in Western journals.

Attaining equity in education is becoming more and more elusive in an unequal world. As a result, education is being commodified in ways rife with current and potential exploitation. The fastest growing businesses in Africa at the current moment are religion and education. Ironically, the two go hand in hand, as Western forms of education were brought to the continent alongside religion to enable the converted to read the scriptures while serving as future bureaucrats.

The systems of higher education have been impacted by globalization in similar ways as other social and economic systems. However, it is their ability to respond to the impact of globalization that sets them apart from other world systems. One area of impact is in internationalization processes as countries respond to globalization trends. In this regard, for instance, higher education systems in Africa have become a market: global partners compete with each other and African universities to attract the best students and faculty. Many offer students with financial means, opportunities to access education, where spaces are limited. Although this increases access opportunities for students who did not have such opportunities previously, it comes at the price of taking away the best teaching staff from public universities and systems. Offering higher salaries than those given by the government or public universities often leads to this practice. Furthermore, cash-strapped institutions also tend to add income generating programs in public institutions and place their best teaching staff in those programs, so that they can remain attractive and generate income for the institution. This represents another form of stratification happening among those with access to higher education. There is increased access but not equity in those practices.

Higher Education in Africa

Higher education in Africa as a continent has gone through a massive revolution since the beginning of the twenty-first century. There has been enormous expansion in the numbers and diversity of students and universities. However, the numbers pale compared to other larger countries; for example, India has over 38,000 degree-granting institutions while the United States has over 7000 institutions. Africa, as a continent has only about 1800 public and private higher education institutions. Despite the revolution that has taken place, the continent is still far from achieving equity goals, however defined. Issues in accessing higher education remain arguably the largest obstacle in this discussion.

Africa has a very young population in need of education. It is estimated that more than half the population is less than 25 years old in some African states.[1] In South Africa, for example, youth (15–34 years) who are the "not in education, employment, or any form of training" (NEET) increased by 466,000 from about 7.4 million in 2013 to about 7.8 million in 2017 DHET 2018). They are in the streets and are like ticking time bombs, if they continue to be discontent with life and future prospects of economic independence. The reported figure for youth unemployment in Africa is 27.2 percent. Among the unemployed, youth make up 60 percent. Using South Africa again as an example, youth unemployment sits around 48 percent. Given changes to world demographics and low birth rates in Western countries, there is a clear and pressing need for providing greater education and skills to African youth to achieve national and global equity, ensure the continuation of the global economy, and address the growing disparities between African and non-African youth. The responsibility of providing the youth with education is a global in order to advance global development.

The UN reports give figures of demographic shifts that indicate that 40 percent of the world population will be African by the end of the century (UNICEF 2014). This is a major shift, given that in 1950, the African population was only 9 percent of the world's population. The figures are based on UNICEF projections that almost 1.8 billion babies will be born in Africa over a 35-year period, with a high survival rate and longer life span averaging 65 years. The population boom has implications for education

[1] See http://worldpopulationreview.com/continents/africa-population/; accessed April 2, 2015.

and development for the continent, especially when thinking about how to include the large masses of youth in education programs, given the currently limited infrastructure and resources of many African nations.

Ignoring access to education and employment for youth or failing to addressing equity issues in society has the potential to be dangerous. In South Africa, for instance, periodic flares of xenophobic attacks emerge due to frustration with the unchanging socioeconomic problems in the communities: lack of access to education or skills training, high unemployment, high poverty rates, and more. The report on progress on Millennium Development Goals in 2014 addresses this issue and makes a case for investing in youth through education, training, and skills development as a strategy to eradicate poverty, as has been done in other countries (UN Secretariat 2014). Additional credence to the strategy and commitment to these interventions must also take on poverty to fight social and economic inequality.

It is important to note that access to institutions of quality higher education is highly competitive, and therefore, available to those with resources to obtain quality high school education as part of their earlier preparation, and in some instances, access is available to the offspring of those who have political connections to influence to admissions into higher education institutions. This is problematic, given the numerous students who are motivated, qualified, and ready to perform in the higher education setting, but are not given opportunities to earn the qualifications from such an education that will increase their employment opportunities. Instead, institutions of higher education are closing their doors and not offering them other choices. The alternatives offered, if any, are not attractive enough, because they are designed, and perceived, to offer qualifications that are inferior to those offered by universities. There are ways to address these perceptions and to use alternative routes, not as dead-end routes without opportunities for further advancement, but rather as stepping stones to other opportunities.

A twin issue to access is quality. In the schooling sector, the EFA Global Monitoring Report stated that, even though access to education had improved, there were still major issues relating to the quality of education received by students within different areas of each country (UNESCO 2015). Quality problems are a result of, among other issues, underfunding, lack of infrastructure, and poorly or untrained teachers.

The problems continue in the higher education sector, because some of those who gain access to colleges or universities are provided with low-

quality educations. Opening access to the majority of students has unfortunately come with a drop in standards, because access is sometimes offered at the expense of quality. In desperation, students are finding themselves attending unaccredited institutions or institutions that are more interested in obtaining higher profit margins than in offering quality education. Some countries attempt to combat these predatory educational practices. For instance, in India, the Ministry of Higher Education provides a list of what are called "fake" universities on its website, so as to help the general public make informed choices about the quality of school they are choosing to attend. However, this does not stop students from registering at these institutions due to increasing competitive pressures in various professional sectors. As already mentioned, the elite members of society have better access to preparatory programs through private high schools, private tutoring, and personal connections. Governments have attempted to equalize opportunities by increasing access to learning opportunities. For example, Ethiopia has recently undergone a major transformation of its engineering programs, as part of its development strategy, including increasing access to historically underrepresented and marginalized groups within the country. This is commendable even though the government now needs to make sure that the programs offered are of high quality and meet international standards.

In the school sector, campaigns for universal primary education projects have had some success in expanding access. There are more children in schools now than in 1990, when EFA 2000 was adopted. The educational trajectories have interesting implications, as it is reasonable to assume many will continue into secondary school before moving into higher education. However, statistics show enrollment in school starts tapering off, as students start to reach secondary education levels. Who among them will have access to higher levels of learning and who will not? What kind of access will that be? Tracking in some systems begins at this point. The students' future career paths are set for them. Some students get placed in tracks that would prepare them for academic studies in universities and colleges, while others are prepared for vocational education, with no future opportunities to enter higher education institutions. Is tracking fair at this early stage of life, given the different learning styles and paces? What factors come into play in determining the future of children? Their home background and socioeconomic status are major factors in determining success and future careers. This calls into question whether the opportunities for success are equitable for all students who have at least some access to education.

Is equity a reality or a myth given the situation just outlined? Equity in an unequal society is problematic. The very basic structure of education systems impacts equity. Traditionally, education systems have sorted students according to attainment. Evidence from studies of secondary and primary schools suggests that such sorting can increase inequalities and inequities, particularly if it takes place early in the education process. This prompts two conclusions: early tracking and streaming need to be justified in terms of proven benefits; and school systems using early tracking should postpone it to a later stage to reduce inequities and improve outcomes.

Education and Development

There are clear tensions inherent in addressing access, equity, and development goals simultaneously in the context of developing countries. The issue on one hand relates to promoting access to higher education for the masses of people who never had it in the past. In doing so, the intervention is undertaken purely for meeting social justice and equity goals and does not necessarily translate into access for human development. This is done mainly through access to undergraduate degrees and access to a diverse range of qualifications that are likely to increase postgraduation employability levels. The benefit of such interventions has increased political stability through the development of citizenship and promotion of democracy and sustainability in many developing countries. There are studies that indicate a link between education attainment and participation in democratic political processes in Africa (Luescher-Mamashela et al. 2015).

On the other hand, interventions for access that promote development refer to higher education, mainly at the graduate level, and especially, at the doctoral level, where the graduates are more likely to be connected to the innovation systems that drive the country's development and economic sustainability. Africa's development and sustainability need to be addressed from this perspective as well. There are a number of foundations supporting postgraduate studies in Africa, such as the Carnegie Corporation, the Mellon Foundation, and national governments like South Africa that have prioritized postgraduate support as part of their strategy for development. This is done in recognition that higher education plays a role in development. The challenge lies in ensuring that it does play that role.

In the past, the function of doctoral education was narrowly defined as playing a role in preparing the next generation of academics for institutions of higher education and other high-level professionals for the other

sectors of society, especially the economy. The debate has now shifted to focusing on linking qualified academics to knowledge production for economic development. Three of the BRICS countries, namely, China, Brazil and South Africa, are setting high targets for the conferral of doctoral degrees and research output along with supporting those efforts with huge investments. In South Africa, the National Planning Commission and the Department of Science and Technology have put forward proposals on doctoral education in South Africa with specific targets supported by arguments linking qualified academics with positive knowledge contributions for development, as well as improving education quality at the higher education level. The targets sets aim at increasing the numbers of qualified higher education academics from 39 to 75 percent in institutions and to produce more than 100 doctoral graduates per million by 2030, compared to the current 28 per million. To reach these targets, South Africa plans to substantially increase the current production from about 1800 to 5000 doctorates per year. The target for South Africa is to increase overall graduate enrollments in higher education to 25 percent by 2030 (NPC 2012, 318–20).

There is a sense of urgency throughout Africa for the production of the next generation of academics. However, plans are not clear on how those goals will be achieved. Examples of initiatives include the 2012 discussions on doctoral education, which took place at the International Association of Universities (IAU) and Catalan Association of Public Universities (ACUP) international seminar entitled Innovative Approaches to Doctoral Education and Research Training in Sub-Saharan Africa (IAU-ACUP 2012); the Southern African Regional Universities Association (SARUA) leadership dialogue, Doctoral Education: Renewing the Academy (SARUA 2012); and finally the IAU's Changing Nature of Doctoral Studies in Sub-Saharan Africa report (IAU 2012; Cloete et al. 2015). These developments and initiatives represent interventions in Africa that potentially can expand the quality of higher education and open access opportunities.

Conclusion: Does Access Really Translate to Equity in School and Society?

Addressing inequities in education has been on the education reform agenda for many decades. and as some predict, will remain so for the foreseeable future. In 1982, Coombs listed equity as one of the critical four

reform agenda items that was predicted to continue into the next century (Coombs 1982). Indeed, three decades later, education practitioners and policymakers are still struggling with ways to ensure meaningful equity in education beyond creating equal practices, in principle, which become unequal in practice.

Increasing or creating educational access is often treated as a first step toward creating a more equitable society. This is often followed by questions relating to the quality of education offered, as more members of society gain access. The call for expansion of access is rarely accompanied by a meaningful increase in educational resources. Zajda (2010) argues that equity and quality are two contradictory policy imperatives. He indicates that quality points to some form of elitism and excellence while equity points to increased access, equality of opportunity, and social justice. According to Zajda (2010), it is difficult to bring the two policy imperatives together in a complementary way.

Numerous scholars have looked at the complexity of achieving equity in schools in both South Africa and the United States. The problems are embedded in each society and spill over into the education systems. Policies alone can never change the situation and must be accompanied by a change in attitude and rigid systems to allow for more flexibility in the cultural context within which education exists.

A challenge exists in providing access that is equitable and offers quality education. Studies have shown the connection between education and social upward mobility, better job opportunities, and higher earnings and quality of life. They point to the need to continue to explore ways of narrowing the gap in accessing educational opportunities. Making quality education accessible to all is a step towards creating an equitable society. The benefits that accrue are not only for the individual, but also for the broader society. However, it should be cautioned that education in itself does not close the gap or fix inequality in society. This is confirmed by a recent analysis by Lawrence Summers and colleagues; Summers, the former president of Harvard University and former US Secretary of the Treasury cautioned us not to conflate educational opportunities that increase individual financial security with the reduction of inequities in society (Hershbein et al. 2015). Addressing social inequities is a constant and multifaceted process that includes, but is not limited to education.

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CHAPTER 3

Educational Expansion in Africa (1965–2010): Implications for Economic Inequality between Countries

Parfait M. Eloundou-Enyegue, Sarah S. Giroux, and Michel Tenikue

Introduction

To its advocates, education is the '*best investment in development*,' but also '*a great equalizer*,' with benefits accruing to both individuals and nations (Ram 1990; King and Hill 1993; Downey et al. 2004). This promise of education as "*an indispensable key … to personal and social improvement*" (UNESCO 1990, 4) continues to be endorsed by major international forums, and it looms large in the UN's Sustainable Development Goal 4 (SDG4), which seeks to "ensure inclusive and equitable *quality* education" (UN 2019).

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Yet this endorsement rests on incomplete evidence. Studies have assessed the equalizing role of education within, but not *between* countries (see O'Neill [1995] for one exception).[1] This oversight is predictable, because analysts often equate income inequality with relative incomes. From that perspective, a simple comparison of national growth rates is enough to infer cross-country inequality: if poorer countries grow at a faster rate than richer ones, then inequality should narrow. Yet, as Firebaugh (1999) demonstrated, a true measure of inequality between countries depends on more than relative growth. It instead integrates information about growth in national economies *and* populations. Indeed, each of these two components can be split further. For the purpose of studying GDP inequality, demographic change can be split into population size and structure (Eloundou-Enyegue et al. 2013). Likewise, economic growth can be split into its constitutive components, whether they are drawn from standard growth accounting models (Barro 1999) or focus on the role of education, as is done here. Altogether, we seek to explain trends in income inequality based on multiple components that include the quantity and the quality of schooling.

Fifty years ago, African countries averaged a mere 1.3 years of education per adult (Barro and Lee 2013). The leading countries at the time, South Africa (4.4 years) and Lesotho (2.9 years), did not exceed an average of 5 years of schooling, while lagging nations, like Niger (0.4 years) and Central African Republic (0.5 years), did not even reach 1 year. Substantial gains have been achieved since. By 1985, African countries were averaging 3.4 years of education, with the lagging countries now near the average level observed back in 1965. In the decades to follow, this pattern persisted. As Fig. 3.1 shows, average attainment rose steadily to 5.5 years by 2010. Although these numbers remain low, compared to other world regions, they represent a fourfold increase over the 40-year period.[2] Many economists would expect inequality to follow a bell curve (Kuznets 1955), but the evidence in Fig. 3.1 shows that educational inequality across African countries declined *first*, *from 1965 to 1985,* before tapering off, from 1985 to 2010. In other words, lagging countries have

[1] For effects on personal well-being, see, for instance, Martin (1995); Ross and Wu (1995); Card (1999); Dee (2004); and Musick, Brand, and Davis (2012). For effects on economic growth, see Romer (1989); Barro (1991); Sala-i-Martin (1994); Pritchett (2001); De Gregorio and Lee (2002); and Cohen and Soto (2007).

[2] In 2010, the average number of schooling years was 5.34 in sub-Saharan Africa, compared to 10.91 years in advanced economies (Barro and Lee 2013).

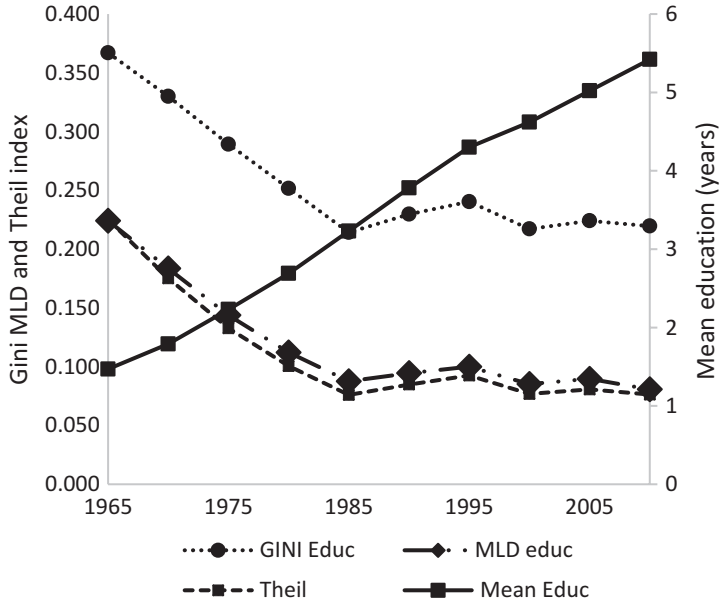

Fig. 3.1 Trends in between inequality in education. (Source: Authors' construction)

begun to catch up educationally, and since the mid-1980s, educational attainment increased almost uniformly across African countries. Fig. 3.1 plots this inequality between 1965 and 2010, using three different measures.[3] Regardless of the metric, the results show a decline. From about 0.37 in 1965, the Gini in educational attainment fell close to 0.22 in 2010, a remarkable 40 percent decline. The decline was also impressive (60 percent), when measured by the mean logarithmic deviation (MLD) and Theil indices.

However, convergence in education need not imply convergence in economic performance, for at least three reasons. First, as enrollments spread, richer countries might improve the quality of their schooling, and they have more resources to do so (Jensen 2010). Second, differences in school quality might translate into differences in economic returns

[3] These measures are somewhat complementary: the MLD is most sensitive to inequality from the bottom of the education distribution; the Theil is most sensitive to inequality near the top; and the Gini is more balanced.

(Pritchett 2001). If these returns are larger among richer nations, economic inequality will continue to widen, in spite of convergence in education. The scenario becomes even more plausible if the gains in enrollments in poorer nations come at the expense of quality. Third, even if educational inequality narrows, other components of inequality, including technology (O'Neill 1995; Sawhill et al. 2006) or demographic change (Firebaugh 1999; Eloundou-Enyegue et al. 2013) can maintain inequality.

Again, economic convergence need not follow educational convergence. Education could well stimulate growth within individual countries without being a '*great equalizer*.' Research questions about education's influence on economic convergence therefore need separate attention. We advance this line of research by examining the link between Africa's convergence in education and GDP. We focus on the 1965–2010 period, which saw remarkable gains in education. Perhaps, more importantly, this period also saw Africa's incomes diverge, while education was converging (Figs. 3.1 and 3.2). The confluence of these two trends offers a unique background for examining how trends in education contribute to

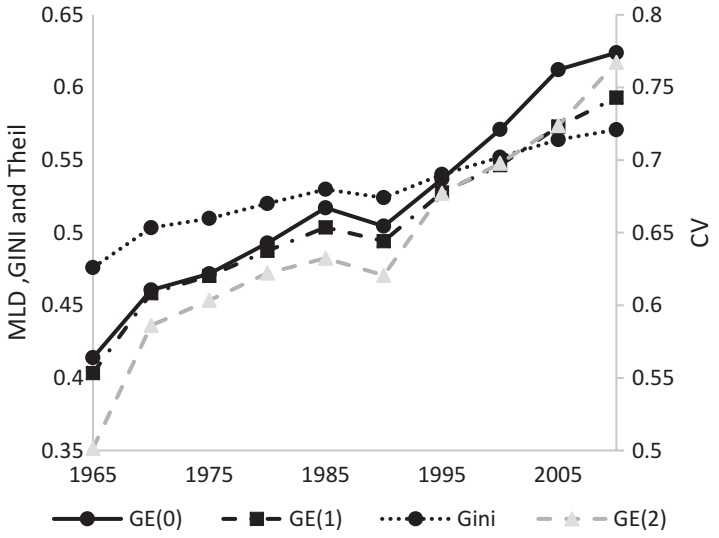

Fig. 3.2 Trends in African income inequality (1964–2010). (Source: Authors' construction; Note: CV = GE(2) is the generalized entropy single parameter class of inequality index. It is thus half the square of the coefficient of variation)

economic convergence in Africa. We ask two questions: (1) Did education work as an economic equalizer during that time period? (2) If so, which aspect (quantity vs. quality) was most influential? We rely on a decomposition method to elaborate our answers to these two questions.

Background and Significance

Education is expected to boost economic growth because it raises the productivity of other factors, notably the quality of the labor force, innovation, and technology (Barro 1991; Barro and Sala-i-Martin 1995; Rosenzweig 1995). It additionally improves health and slows population growth (King and Hill 1993). However, an economic boost from education is more likely if the skills gained are in demand and are put to use. A boost is less likely if jobs are concentrated in the agricultural and informal sectors. As it boosts growth across countries, a regional expansion of education could reduce international inequalities. If poor countries catch up educationally, the rising number and productivity of educated workers, along with slower population growth and improved health, combine to bring these countries closer to leading economies (Tamura 1991). Yet, as argued earlier, this economic convergence is not automatic, and it has not been documented within Africa.

Africa's recent advances in schooling were all the more remarkable as they occurred under a context of rapid population growth. Africa's population grew by a factor of 2.3 between 1965 and 2010, and gains in enrollment were widespread, as indicated by the trends in educational inequality shown in Fig. 3.1. Unlike education, however, economic inequality was on the rise (Fig. 3.2). Regardless of the inequality measure used, there is a clear rise in between-country income inequality between 1965 and 2010. The income Gini increased from 0.59 in 1965 to 0.94 in 2010. The 61 percent jump observed can be paralleled to the drop observed in inequality in education. In light of this close temporal correlation, the obvious question is whether education contributed to this income divergence.

Our extensive review of the literature on the contributions of education to international income inequality unearthed a single study by O'Neill in 1995. The study used a method of variance decomposition to account for the historical change in cross-country income inequality into education levels, returns to education, and a residual. It showed mixed results, with trends in schooling levels fueling convergence, while trends in returns to schooling widened inequality. It covered the years from 1967 to 1985,

and repeated the analyses for four groups of countries: world, developed countries, Europe, and least developed countries (LDCs). The study found similar results across Europe and developed countries, and the results starkly differed from those found at the global level and across LDCs. Across developed countries, the convergence in education level contributed to reduce income inequality, while the "quality" of education widened inequality, but the contribution of the former outpaced that of the latter. Across LDCs, a similar pattern was found, but the contribution of quality outpaced that of quantity. While O'Neill covered LDCs as a whole, we focus specifically on Africa.

Africa is interesting as a setting for this study. Substantively, the region covers a long span from early to more advanced stages of educational development. Furthermore, since school attainment remains low (below 6 years) in Africa, compared to advanced economies (above 10 years of schooling) (Barro and Lee 2013), there is much to be learned about the early contribution of education, especially if private returns to education are smaller early on (Kuepie et al. 2009), and if the economy remains dominated by low-skill and informal-sector occupations.

Methodologically, it is easier to test the effect of education on between-country income inequality if (as was the case in Africa) there is sufficient variance in the economic and educational trends. As a juxtaposition of Figs. 3.1 and 3.2 shows, the region's inequalities ebbed and flowed. Between 1965 and 1985, educational inequality fell by 60 percent, from 0.224 to 0.088, while both income inequality and education levels were rising. The second phase began in 1985, ending in 2010. Educational inequality remained almost constant over that period, but the average number of years of education was still increasing, and income inequality kept rising after a brief stabilization between 1985 and 1990. This variance in the trends of education and income (and their inequalities) makes it possible to test the nexus between education and income over a wider range of circumstances.

Yet another reason why Africa is uniquely interesting has to do with its demographic trends. Birth rates are falling in the region (World Bank 2019), with corresponding transformation in age structure. In response, a growing body of literature is exploring the impacts of these demographic changes on socioeconomic development (Bloom et al. 2003; Lee and Mason 2006; Eastwood and Lipton 2011; Canning et al. 2015). We can enrich this literature on demographic dividends with new insights on inequalities. Our decomposition analysis will show whether the well-

documented variation in the pace and timing of national transitions in the region (Garenne and Joseph 2002; Bongaarts 2008; Ezeh et al. 2009; Schoumaker 2009; Shapiro and Gebreselassie 2009; Bongaarts and Casterline 2013) led to a corresponding widening of economic inequality. While previous studies have investigated dividends at the national level and focused on average gains, our study will focus on the region and its between-country inequality.

Methods

A paucity of methods is one reason why the link between education and economic inequality remains understudied. Cross-country correlations have been used by default. In that perspective, if a researcher should find improvements in schooling to be systematically correlated with gain in GDP per capita, s/he might infer that growing inequalities in education would also imply growing inequalities in GDP. The faulty assumption, however, is that GDP returns to schooling are similar across countries (Kuepie et al. 2009). Moreover, this perspective falsely uses countries (rather than a region) as the unit of analysis. On the other hand, should a researcher focus on the region as analytical unit, s/he would face a daunting problem of sample size, as s/he would be dealing essentially with a sample of one.

Decomposition methods offer a solution to the problem. In the simplest case, the level of inequality within the region can be described as reflecting both the relative GDPs of countries (i_j) and their relative population sizes (p_j) (Firebaugh 1999). Thus, historical changes in inequality can be decomposed into the effects of national changes in relative population size versus relative incomes. If we use the MLD as a metric, the total inequality can be described as in Eq. 3.1, and the change in inequality can be decomposed (Eq. 3.2) as a function of the relative incomes and their share of population (see Mookherjee and Shorrocks 1982):

$$MLD_t = \sum p_{jt} * \ln\left(\frac{1}{i_{jt}}\right) \tag{3.1}$$

$$\Delta MLD \cong \left[\sum\left(\overline{i_j} - \overline{\ln\left(i_j\right)}\right) * \Delta p_j\right] + \left[\sum\left(\overline{p_j i_j} - \overline{p_j}\right) * \Delta ln\left(i_j\right)\right], \tag{3.2}$$

where barred values represent averages, and Δ marks a change between two time periods. For instance, when studying change in African inequality between 1960 and 1990, $\overline{i_j} = \left(i_j\left(1960\right) + i_j\left(1990\right)\right)/2$, and Δp = p_{1990} − p_{1960}.

However, the simple decomposition in Eq. 3.2 is limited. It does not reveal components of theoretical interest in our analysis, such as the influence of education, including its quality and quantity. It also obscures the role of influential economic variables (such as productivity) or population variables (such as age structure). Therefore, we develop a slightly more detailed explanation by re-expressing GDP per capita (i_j) as a function of GDP per working age population (π_j) and the age structure of various countries (a_j) [Eq. 3.3]:

$$i_j = g_j/n_j = \left(g_j/a_j\right) * \left(a_j/n_j\right) = \pi_j a_j, \tag{3.3}$$

where g, n, and a are the national income, the total size of the national population, and the size of the working age population, respectively.

$$\begin{aligned} \Delta MLD \cong & \left[\sum\left(\overline{i_j} - \overline{\ln\left(i_j\right)}\right) * \Delta p_j\right] + \left[\sum\left(\overline{p_j i_j} - \overline{p_j}\right) * \Delta ln\left(a_j\right)\right] \\ & + \left[\sum\left(\overline{p_j i_j} - \overline{p_j}\right) * \Delta ln\left(\pi_j\right)\right] \end{aligned} \tag{3.4}$$

Given our interest in education, we refine the last term in Eq. 3.4—the productivity effect—to highlight the role played by a well-educated workforce (Barro 1991). Using regression analysis, we express labor productivity (π) in terms of the macro returns to schooling (R), schooling levels (S), and an error term (E). We assume that education affects contemporaneously labor productivity in the following way[4]:

$$Ln\left(\pi_{jt}\right) = \alpha_{jt} + R_{jt} S_{jt} + e_{jt} \tag{3.5}$$

$$\Delta Ln\left(\pi_j\right) = \Delta a_j + \overline{R_j}\,\Delta S_j + \overline{S_j}\,\Delta R_j + \Delta e_j \tag{3.6}$$

[4]We repeated the same analysis assuming a five-year lag in the effect of education on productivity. Results (available upon request) are qualitatively similar to those presented here.

One can insert Eq. 3.6 into Eq. 3.4 and obtain yet a more detailed decomposition, Eq. 3.7. This final formulation apportions the total change in income inequality over a period into five sources[5]:

Total population (P): the changes in the relative size of African countries. Countries that grew faster during that period will have a disproportionate influence on trends.

Age structure (A): Countries whose age dependency ratios changed the most will have a disproportionate influence on trends.

The total effect of changes in countries' productivity, itself subdivided into the effects of education and other factors.

Returns to education (R). These returns change historically and in ways that vary across countries.

Education levels: the average level of education in the country.

Others: This is the part of productivity not accounted for by education.

$$\Delta MLD \cong \overbrace{\left[\Sigma\left(\bar{i}_j - \overline{\ln(i_j)}\right) * \Delta p_j\right]}^{P} + \overbrace{\left[\Sigma\left(\overline{p_j i_j} - \overline{p_j}\right) * \Delta ln\left(\alpha_j\right)\right]}^{A} + \underbrace{\left[\Sigma\left(\overline{p_i i_j} - \overline{p_j}\right) * \bar{S}_j \Delta R_j\right]}_{R} + \underbrace{\left[\Sigma\left(\overline{p_i i_j} - \overline{p_j}\right) * \bar{R}_j \Delta S_j\right]}_{S} + \underbrace{\left[\Sigma\left(\overline{p_i i_j} - \overline{p_j}\right) * \Delta e_j\right]}_{E} \quad (3.7)$$

One challenge in this analysis is to obtain R_{jt}, that is, the country- and time-specific values on the GDP returns to education. Our estimation strategy builds on the expectation that returns vary with the stage of educational development (Krueger and Lindahl 2000). Thus, we estimated the country- and period-specific parameters in Eq. 3.5 with a regression pooling data for all countries and years, but also including variables for J (dummies for country) and T (dummies of the time period):

$$\begin{aligned} Ln\left(\pi_{jt}\right) &= \alpha_{00} + \beta_{00} S_{jt} + \beta_1 J + \beta_2 T + \beta_3 J S_{jt} + \beta_4 T S_{jt} + e_{jt} \\ &= \left(\alpha_{00} + \beta_1 J + \beta_2 T\right) + \left(\beta_{00} + \beta_3 J + \beta_4 T\right) S_{jt} + e_{jt} \\ &= \left(\alpha_{jt}\right) + \left(R_{jt}\right) S_{jt} + e_{jt} \end{aligned} \quad (3.8)$$

[5] It has to be noted that a final term, the intercept or baseline productivity $\left(\left[\Sigma\left(\overline{p_j i_j} - \overline{p_j}\right) * \Delta\alpha\right]\right)$, was not considered here because it sums to zero.

This formulation in Eq. 3.8 helps move beyond a black-box understanding of the effect of quality of education. As the formula shows, this overall effect comprises a "multiplier" effect, β_3, arising from a general improvement in the global returns to schooling in year T, and a "differentiation" effect, β_4, reflecting the extent to which changes in the returns differ between countries). Following Behrman and Birdsall (1983), β_3 can also be seen as the return to the quality of schooling. Accounting for the complementarity between quantity and quality of education, the dummy variable J captures the country's school quality and the ability of the schooling system to generate necessary productive skills needed by the economy. In this respect, the value of R_{jt} can be seen as incorporating the overall return to education.

Data and Measures

The input data required to apply Eq. 3.7 was retrieved from the World Development Indicators (WDI) database (World Bank 2019) and from Barro and Lee's (2013) ("BL" hereafter) new data set of educational attainment in the world. The WDI contains over 1300 socioeconomic indicators on 54 African countries and territories for each year since 1960. The indicators taken from this database included total population, the share of the population aged 15–64, and GDP per capita at constant 2005 US$. The WDI database is extensive but plagued by missing data. For instance, the GDP is not available for all countries over the entire period covered. The BL data is available for 35 African countries, and it provides a contemporaneous measure of educational attainment at five-year intervals, from 1950 to 2010. It includes the distribution of educational attainment of country education used; for this study, it is the average number of years of school attainment for the population aged 15 and above. The data from WDI and from BL are merged to generate the data used in this chapter. The resulting merge contains the required data for 25 countries (Table 3.1).

In using these data, one has to worry about the comparability of national statistics. The GDP (at constant price) and total population are easily comparable, because they are produced for all countries and territories with a standardized procedure. In addition, they are cross-validated by the United Nations, the International Monetary Fund, and the World Bank. The age structure is found in the WDI and is based on data from the UN's Population Division. Our education variable is produced with the same procedure across counties, and its comparability has been improved to "address most of the concerns raised by critics" (Barro and Lee 2013).

Table 3.1 Country contribution to change in income inequality (1965–2010)

	Total country contribution to change in MLD (% of region)	*Sources of country contribution (% of country contribution)*					
		Population component		*Economic component*			
					Education		*Others*
		Size	*Age Structure*	*Quality*	*Quantity*	*Total*	
Algeria	−21	−74	72	−85	103	18	84
Botswana	−6	1	7	−17	92	76	17
Lesotho	−4	47	1	−17	47	30	22
Rwanda	−4	15	8	−46	59	13	64
Kenya	−4	557	−59	303	−446	−143	−255
Burundi	−2	111	−14	−45	15	−30	33
Sudan	−2	166	3	41	−45	−4	−65
Congo	−2	70	−4	−19	41	22	12
Sierra Leone	−2	124	−23	−33	−17	−50	48
Malawi	−1	−226	−77	−216	418	202	201
Cameroon	−1	−30	−116	−291	439	148	98
Benin	−1	−92	−10	−214	424	210	92
Gabon	0	−53	−55	−130	288	158	51
Ghana	0	91	5	−206	−41	−247	252
Mauritania	0	119	0	162	−61	101	−120
CAR	1	212	−36	−64	−94	−158	82
Togo	1	96	21	140	−86	54	−72
Senegal	4	40	18	54	45	99	−57
Zambia	5	57	19	72	39	111	−87
Liberia	5	−28	11	22	165	188	−71
Zimbabwe	6	−113	−18	219	−37	182	49
Cote d'Ivoire	7	87	4	12	7	20	−11
South Africa	8	−589	288	−1346	842	−504	904
Niger	18	33	11	7	55	62	−6
DRC	95	9	8	13	74	87	−4
Total	100						

Source: Authors' construction

The BL data are given at a five-year interval, while WDI data are provided annually. There are two options for merging the two databases. The first is to select only WDI data corresponding to the end year of the 5-year period year, and the second is to compute five-year averages of the WDI data. We opt for the second approach and compute the corresponding

five-year averages.[6] Thus, the GDP used for 1965 is the average GDP of the years 1961 to 1965. The GDP used for the subsequent years (including 1985, 1990, 2005, and 2010) are computed as average GDP for the respective periods (1981–1985, 1986–1990, 2001–2005, and 2006–2010). The values used for the population and the age structure are computed similarly.

Findings

Table 3.2 summarizes the trends and drivers of GDP inequality between African countries. The first three columns focus on the trend. Results are presented for the full study period (1965–2010, first line) and for the selected two subperiods (1965–1985 and 1990–2015, next two lines below). Over the entire period, income inequality between African countries rose from 0.41 to 0.62, a 50 percent increase. However, the trend was not all linear. A 0.10-point rise between 1965 and 1985 gave way to a small drop (−0.01) between 1985 and 1990, and finally a substantial increase (0.12) during the last period. The general divergence observed here is consistent with earlier analyses (Kandiwa 2007).

The aim in this study, however, was to go beyond mere description and explain the observed trend in inequality. The remaining columns in the table thus describe how three broad sets of forces (population, education, and other economic) fueled this trend. The population and education components are further split into subcategories. Population, for instance, is subdivided into its total size and age composition. Education is likewise subdivided into the quality and quantity of education (proxied here by returns to education and level of educational attainment, respectively). In theory, the third broad category (other economic) also comprises multiple subcomponents, but their detail was not investigated, given the study's focus on education. These three components are discussed in turn.

Population

Over the entire period from 1965 to 2010, population variables, taken together, made a large contribution (+18 percent) to Africa's GDP divergence. However, its two components worked in opposite directions. Overall, the population size component contributed to reduce income

[6] We also carried out the analysis with the first approach (end-of-period data). Results (available upon request) are qualitatively similar.

Table 3.2 Decomposition results for the contributions of education and other factors to the changes in between country inequality (Africa*, 1965–2010)

	Inequality Levels			*Decomposition of Change*					
				Population		*Economic*			
			Change			*Education*			*Others*
Time Periods	*MLD 1*	*MLD 2*	*Δ MLD*	*Total Population*	*Age Structure*	*Quality*	*Quantity*	*Total Education*	
1965–2010	0.414	0.624	0.21	−19%	37%	−55%	104%	49%	33%
1965–1985	0.414	0.517	0.103	−20%	22%	−8%	45%	37%	61%
1990–2010	0.504	0.624	0.120	−10%	42%	−67%	75%	8%	60%

Source: Authors' construction

*These are 25 African Countries with data on education over the period covered by Barro and Lee (2013)

Total population: country's share of global population
Age Structure: share of country's population between the ages of 15–64
Education: total contribution of education, sums the effects of returns to education (quality) and level of education (quantity)
Quality: proxied by returns to schooling (effects of an additional year of education on the productivity of 15–64 population)
Quality: schooling levels (average years of schooling per adult)
Others: contribution of all other factors, except for education, to productivity (GDP per person aged 15–64 years old)

inequality (−19 percent). In other words, countries grew at different rates, with the richer and/or poorer countries growing more slowly than countries in the mid-income range, a pattern consistent with predictions from Easterlin's demand–supply theory (Easterlin 1975). In that framework, fertility demand is expected to be low in rich countries, but conversely, the supply of fertility is constrained by poor health and nutrition among the poorest countries. Historically, the contribution of population size on the economic divergence between African countries decreased over time. From −20 percent in the 1965–1985 period, it fell to −10 percent in the last period. In sum, rates of population growth became a little more similar across the study countries.

While trends in population size helped reduce inequality, those in age structure raised it. They accounted roughly for a third (37 percent) of the divergence in GDP observed among African countries between 1965 and 2010. Two observations are noteworthy. First, the contribution of age structure is higher (in absolute terms) than that of population size. This stands in contrast to the tendency, in much of the existing literature on international inequality, to focus on population size as the key demographic variable (see Eloundou-Enyegue et al. 2013). Our current findings, as well as the burgeoning literature on the demographic dividend (see Bloom et al. 2003), point to age structure as the more influential demographic trend. A second noteworthy fact is that the influence of age structure in fostering economic divergence grew over time: from 22 percent in the first period, it nearly doubled, reaching 42 percent during the last study period. This finding is unsurprising in light of the staggered onset of Africa's fertility transitions (Shapiro and Gebreselassie 2009; Bongaarts and Casterline 2013), as well as emerging national differences in the economic dividends generated as a result (Eloundou-Enyegue and Giroux 2013).

Other Factors

The residual group includes economic variables, such as total factor productivity and other variables, but these were not studied in detail here, given our intended focus on education. Although these factors are unspecified, they account for a large chunk (33 percent) of the total divergence observed. The magnitude of their influence remained similar across the

two study periods (61 percent in 1965/1985 versus 60 percent in 1990/2015).

Education

We finally turn to the contributions of education, looking at total contribution (shaded area) in Table 3.2, and specific contributions from the quantity and quality of education. For the entire study period, education accounted for a large share (49 percent) of the increase in inequality. This total effect was larger for the first study period (37 percent), compared to the second study period (8 percent). Our main interest was in comparing the influences of the quantity versus quality of education. In that area, three findings were noteworthy.

First, the two components of education worked in opposite directions, with the trends in quantity helping to raise GDP inequality, while trends in quality reduced it. That these two contributions are in opposite directions warrants some attention to quality alongside quantity of education. This is especially important, given the suggestion that convergence in quality had been a substantial force for convergence, accounting for −55 percent of the trend: had this trend in quality not occurred, the divergence in GDP in the region would have been even more severe.

Second, the historical changes in education quantity did promote divergence of African countries (104 percent). This seems counterintuitive, especially in light of the result (Fig. 3.1) showing a tapering off of educational inequality in the last two decades. However, as Table 3.2 shows, this mostly reflects the influence of a few large countries that had relatively low schooling levels (the Democratic Republic of the Congo [DRC] and Niger) and that also experienced subpar progress in education. The influence of the quantitative aspect of education increased over time, from 45 percent to 75 percent. Of all factors in this analysis, the quantity of education was the single largest contributor to the trend in GDP inequality. This was true whether one focused on the full study period, or the second subperiod considered in the analysis. Clearly, the expansion of mass education is an important factor in shaping the region's trend in inequality, but in this case, it did not contribute to the reduction of GDP inequality in the region, in spite of the relative convergence in schooling levels noted, especially during the period from 1965 to 1985.

On the other hand, trends in school quality appeared to foster some convergence in GDP per capita among the countries in the region. Again,

had the differences in school quality remained as they stood at the start of this study period, the levels of GDP inequality would have been 55 percent higher than was ultimately observed in 2010. The role of school quality in fostering economic convergence increased over time. While it only reduced GDP inequality by 8 percent over the first study subperiod, the trend in schooling inequality contributed to a 67 percent reduction in inequality over the second subperiod. Clearly, differences in school quality are an important factor in debating the role of education as an economic equalizer between countries. Although the quantity of education wields the larger influence in absolute terms, the quality of education appears to have been the more influential force, if the required direction is a reduction in GDP inequality.

Which countries were most influential in this process? Beyond identifying the most important substantive forces, decomposition analyses can also reveal countries that were most influential in shaping the trend in GDP inequality. Indeed, the analysis can combine the two pieces of information to show, for each country, how much of the national contribution was tied to the country's educational performance, whether in quantity or quality of schooling. The results from this analysis are found in Table 3.1. The largest contributors to economic divergence over the study period include the DRC (95 percent), Niger (18 percent), South Africa (8 percent), and Côte d'Ivoire (7 percent). Countries can contribute to divergence in two ways: the first is when a relatively affluent country experiences above average growth during the period (this seems to have been the case for South Africa) or when a relatively poor country (on a per capita basis) achieves subpar growth (as was presumably the case for Niger and the DRC). At the opposite end of the process, countries fostering convergence include Algeria (−21 percent) and Botswana (−6 percent), two relatively prosperous countries in the mid-1960s that achieved subpar growth over the study period. One can explore, in greater detail, how these influential countries made their contributions, and the results are also found in Table 3.1. Although the results are given for all countries, they tend to be unreliable for countries making relatively small contributions, because decomposition in that case attempts to slice very small numbers. These less reliable findings are shaded in Table 3.1. As the table indicates, the DRC's contribution to divergence is largely explained by its subpar performance in the education sector (87 percent overall, with 74 percent for schooling level and the balance, 13 percent, from school quality). Niger's underperformance in education is similarly the driving factor

for this country lagging further behind and its contribution to the expansion of inequality in the region. On the other hand, South Africa did not owe its contribution to education. The country's disproportionately strong economic performance (which fueled inequality) reflects other factors not included in this analysis (904 percent), as well as changes in age structure (288 percent), a fact consistent with the documented record of this country being at the forefront of the demographic transition (Swartz 2002) and being among the first to see the signs of a demographic dividend, including in the education sector (Eloundou-Enyegue and Giroux 2013). At the other end of the list, Algeria was the most influential country in buffering the trend toward divergence. It did so primarily though "other economic factors" not studied in detail here, although the leveling off of its education also played a role.

Conclusion

This study explored the salience of education as a factor in shaping trends in economic inequality between countries. The core hypothesis—that countries should converge economically if they begin to converge educationally—had not been often examined in sufficient detail or in African settings. Some of the detail lacking concerned the relative magnitude of education effects, and the most relevant dimension of education. Compared to other forces, how large is the influence of education in shaping economic convergence among countries? And is quality as important as quantity in this process? Our analyses of recent patterns in Africa do confirm education as a very influential force, which accounted for nearly half of the trends in inequality occurring during the study period. In adjudicating between quantity and quality, the study generates mixed findings. On the one hand, the quantity of schooling is a more influential force, in absolute terms. On the other hand, trends in the quality of education were found to work in the direction of containing inequality. One could say that, as far as *reducing* GDP inequality among African countries over this study period, schooling levels were more important quantitatively (total effect), but school quality was more so qualitatively (direction of effect).

Two important caveats must be recalled when appraising these results. First, the analyses rest on a relatively small subset of African countries, owing to missing data on some of the key variables. Second, the decomposition methods used in this chapter do not establish a causal relationship. They simply show, in accounting perspective, how much of the

change in inequality is associated with concurrent changes in a range of components that constitute inequality. Nonetheless, the study does signal the potential contributions of education to economic convergence of African countries. At the same time, it highlights the importance of quality alongside quantity of schooling. If education is to work as an international equalizer in the region, convergence is needed in both the quality and quantity of schooling. Although quantity appeared to wield the larger influence during the study period, convergence in the quality of schooling brought nations in the right direction, if one of the goals of educational expansion is to reduce economic inequality across countries of this region.

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CHAPTER 4

Free Education, Schooling Outcomes, and Wages: An Inequality Analysis in Benin after the 2006 Free Tuition Policy

Gbetonmasse B. Somasse

Introduction

Studies have documented the key role of education and human capital in economic development, particularly at the primary level (see, for example, Hanushek and Kimko 2000; Pritchett 2001; Wantchekon et al. 2015). Education is also associated with income distribution (for example, Mincer 1974; De Gregorio and Lee 2002). Schooling attainment has a significant effect on individual earnings in Benin, even in the informal sector (Kuepie et al. 2009). As such, differences in educational outcomes may drive income inequality with its relationships to growth, poverty reduction, and the attainment of key development goals, at least for poor countries (Barro 2000). The commitment of several governments to achieve universal primary education has prompted more countries to make access to primary education free.

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Benin's inequality measured by the Gini coefficient of per capita consumption was relatively high, at 53 percent, in 2006 (Alofa et al. 2011). Moreover, the Gini coefficient of average years of schooling for the 15-to-24-year-old cohort was 71 percent in 2006. In Benin, dimensions of educational inequality include region, wealth, and gender. In 2006, more than 20 percent of school-aged children were not enrolled in school, and eight of the twelve regions had education indicators below the national average. According to a survey of parents, the primary factor that kept children out of school was the inability of their families to pay school-related fees (INSAE and ILO 2009). This explanation is consistent with the finding by Kattan and Burnett (2004) that user fees are a major obstacle to universal education in developing countries. About 61 percent of school-aged children in the poorest quintile were not enrolled, compared to only 16 percent for the top quintile. The gender imbalances are stronger since 67 percent of the poorest girls were kept out of school, compared to only 39 percent of the wealthier girls.

These schooling disparities, if not corrected, may translate into higher income inequality for future generations. To reduce the dispersion and achieve universal primary education, a key strategy adopted in Benin was to reduce costs borne by parents. In October 2006, the Government of the Republic of Benin announced the abolition of tuition fees for primary and preschool education in all public schools. In fact, this policy is in line with the country's Constitution, the Orientation Law on Education, and other international conventions signed by Benin to promote primary education. Subsidies to schools and increased resources to primary education support the decision. The primary-level share of public expenditure on education increased on average from 52 percent in 2005 to 56 percent in 2006–2011. The number of schools increased by 49 percent, translating into more than one school per 300 children aged 5 to 14 in 2005.

As a result, the country has experienced a rapid expansion of primary education enrollment in recent years. Data from education statistics in Table 4.1 suggest that the net enrollment rate rose from 77 percent in 2005 to 91 percent in 2011. The differences in non-enrollment between poor and rich have significantly narrowed. Based on the results from the Integrated Modular Survey of Household Living Conditions (EMICoV) and the Demographic and Health Survey (DHS) in 2011, only 35 percent of the poorest children are not in school, which is significantly closer to 18 percent in the top quintile. The catchup is faster for girls. Their non-enrollment rate is only 39 percent in the poorest quintile, compared to 22

Table 4.1 Evolution in enrollment indicators in primary education (2004–2011)

	2004	*2005*	*2006*	*Average 2004–2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*Average 2007–2011*
Number of pupils (millions)	1.177	1.163	1.178	*1.172*	1.290	1.454	1.519	1.787	1.869	*1.584*
Admissions in first year	255,195	275,672	294,506	*275,124*	333,095	411,579	404,755	405,755	412,180	*393,473*
Gross enrollment rate (%)	95	93	92.9	*93.6*	98.5	104	109	110.58	112.62	*106.9*
Net enrollment rate (%)	80.56	77.05	77.73	*78.4*	82.7	83.04	88.64	90.28	91.23	*87.2*
Gross intake rate (%)	99.33	NA	NA	*99.3*	119.32	142.96	140.01	132.18	130.73	*133.0*

Source: Benin Ministry of Education and author's calculations

percent in the richest one. The northern region, even with some progress, leaves 43 percent of children unenrolled compared to less than 20 percent for the center and the south in 2011.

Overall, the free primary education policy and the improved supply of education has increased enrollment significantly and will increase the educational attainment of the population. Gender and regional gaps in education have also improved substantially over time. The average number of years of schooling achieved was 5.37 years in 1990. It reached 7.01 years for boys and 4.96 years for girls. The proportion of the population who has completed at least the primary school level has increased from 40.5 percent in 2005 to 45.6 percent in 2010 and 50.9 percent in 2011, according to the National Institute of Statistics (INSAE 2012).

In this chapter, I first assess the changes in the distribution of educational outcomes by evaluating whether the policy contributed to eliminating the gender gap and geographical disparities in educational outcomes and whether there were any trade-offs between broad access to schooling and quality of learning. This is important since the improvement in human capital depends both on years of schooling and on the quality of learning. Next, using individual Mincer-type earnings functions, I estimate returns to education by accounting for possible endogeneity of the education variable. Finally, given that the short length of the policy implementation does not allow more precise quantitative estimates, I use simulations to provide some magnitude of the impact of the free primary education policy on future wage differentials, as schooling inequalities get smaller.

Understanding changes in the distribution of educational outcomes is important in designing policies to achieve development goals, such as universal primary education for all children, the elimination of gender inequality, and the reduction of regional disparities.

The chapter leverages a unique combination of administrative educational data at the municipal level and two nationally representative household-level surveys to provide both descriptive and econometric evidence of the changes in educational outcomes and their distribution across gender, region, and wealth levels.

The result suggests that the abolition of primary school tuition has attenuated the inequality of access to primary school by increasing enrollment of traditionally disadvantaged groups, including girls, low-income groups, and the populations of the northern region. While the importance of family background on enrollment has been significantly reduced after the policy was implemented, student socioeconomic characteristics are still

important determinants of student learning. The simulations suggest only limited changes in wage inequalities in the short term following the policy implementation.

The rest of the chapter is organized as follows. I first discuss the policy for free primary education and describe the methodology for analyzing changes in inequality using a Mincer-type wage equation and simulations. Then, the data description and a discussion of the results comprise the final sections.

Methodology of Inequality Analysis

The inequality analysis of the impact of the free primary education policy includes the determinants of access to the education system, the determinants of student's performance in schools, and the implications for income distribution using an earning equation.

Effects of the Policy on the Determinants of Access to Education and Student Performance

In order to analyze the inequality of access to education and the inequality of performance in schools, I evaluate the impact of the policy in Benin, using both municipal and household-level data. I assess the impact of the policy on the determinants of enrollment and student performance across gender, region, and socioeconomic status.

Municipality t's educational achievement, A_{it}, in period t is modeled as the outcome of a production function that combines students' characteristics and socioeconomic conditions as inputs:

$$A_{it} = A\left(C_{it}, M_{it}, E_{it}, u_{it}\right), \tag{4.1}$$

where u_{it} is an error term. The education outcome of interest—the enrollment status or passing of the CEP exam—is a binary variable measured for each student. The CEP is the national examination for completion of primary school, and passing the exam is used as a proxy for quality of learning in this analysis. The inputs are students' characteristics C_{it}, family and community characteristics M_{it}, and school characteristics E_{it}. Most education data are only available aggregated at the municipal level, suggesting a log-odds specification for the process of data generation:

$$\ln\left(odds_i|X_i\right) = \ln\left(\frac{\left(p_i|X_i\right)}{\left(1-p_i|X_i\right)}\right) + \varepsilon_i = \beta_0 + \beta_1 X_i + \varepsilon_i, \tag{4.2}$$

in which p_i is the observed proportion of occurrences of the outcome in the i^{th} municipality. The log-odds equation is similar to the "logit" equation since the logit is defined as the natural log of the odds. The log-odds model can be *consistently* estimated as an ordinary least squares (OLS) regression for the data available at the municipality level.

When using household-level data, with enrollment status for each individual child in the sample, a logit model is directly estimated.

Schooling Inequality and Simulation of Wage Inequality

As detailed in the results section, the analysis of municipal and household-level data suggests a positive effect of free primary education (FPE) on enrollment, especially for the poor, the girls, and the school-age children in the northern region. Since schooling attainment has a significant effect on individual earnings in Benin (Kuepie et al. 2009), any reduction in schooling inequality may also drive income inequality.

In order to assess the magnitude of the relationship between schooling inequality and income inequality, I use a Mincer-type wage equation to simulate future wage differentials, as schooling inequalities get smaller. The relationship between education and income is a basic concern for labor economists and development economists. Wages and salaries are the most important sources of income. Wage differentials exist across individuals with different levels of education, years of experience, gender, race, and marital status. I focus on human capital theory with the framework of Mincer's (1974) wage equation. The data set allows the estimation of an earning model with an analysis of potential endogeneity of the education variable.

I consider a "one-factor" human capital model with a single measure S_i for schooling such as the number of years of schooling. As a starting point, return to education will be first estimated using OLS on a simple Mincer-type earnings function, as in the following equation:

$$\ln y_i = \alpha_i + \beta S_i + \varepsilon_i, \tag{4.3}$$

where α_i represents relative levels of earnings for individual i for any given level of schooling, and β measures the marginal return to schooling level, S_i,in terms of the earnings y_i. The term ε_i is meant to capture measurement error in earnings.

The β estimate varies with the method of estimation used. I used three alternative methods: OLS, the instrumental variable method, and the Heckman sample selection method (Card 1999, 2001; Duflo 2001; Heckman and Li 2004). The instrumental approach requires an instrument that determines education choices but not earnings. The Heckman models account for selection into employment or sector of employment. The returns to education are estimated for the working population. I use the father's characteristics as instruments to account for any potential endogeneity of the education variable.

The wage equation is only estimated for urban workers, using data from the 1–2–3 surveys conducted in Cotonou in 2001–2002 by INSAE, the Benin Institute of Statistics. Assuming that the wage equation remains stable over the period of analysis, I simulate the effects of different scenarios of changes in educational attainment on changes in wage inequality. Since the 1–2–3 survey used for the wage equation only samples urban dwellers, I use the urban sample of the 2006 DHS survey as the baseline for individual characteristics. Taking the individual characteristics from this sample as given, I calculate predicted hourly wages. This allows the estimation of the initial wage inequality measures in the samples (Grosse et al. 2009). To simulate the effect of the policy on wage distribution, I draw samples of working hours, based on the mean and standard deviation from the 1–2–3 sample. Finally, using various scenarios of change in educational attainment, I assess the change in income inequality. The Gini coefficient and the 90/10 ratios are used as measures of income inequality.

One might expect general equilibrium effects since an expansion of education will lead to an increase in the supply of educated people and reduce the returns to education (Heckman et al. 1998). For example, there is some evidence that China's expansion of higher education in 1999, along with a small cohort, due to China's one-child policy, led to important labor market consequences, including a decrease in job opportunities and wages for college graduates (Li and Xing 2010). On the other hand, the increased educational attainment may result in knowledge spill–overs when a critical number of well-educated workers help grow the economy faster with shared benefits (Moretti 2004). Therefore, the overall effect is a priori ambiguous.

Data limitation does not allow an estimation of the magnitude of the general equilibrium effect on wages to build this into the simulation. For example, it would be helpful to know how much wages would fall if primary school completion increased by 10 percent. This information could provide an idea of whether the results are sensitive to reasonable general equilibrium effects.

If $y_{0,i}$ is person i's wage with no primary school attendance, and $y_{1,i}$ is a person's wage with the completion of primary school, then $\Delta_1 = y_{1,i} - y_{0,i}$ is the treatment effect on person i. This difference can be used to evaluate the impact of free primary education on wages. This effect is constant only if wages before and after the policy are invariant to the number of primary school graduates in the economy. The analysis at the primary school level is also valid at the high school, college, and graduate levels, as FPE might induce higher completion rates at the higher-education level. If there is any general equilibrium effect, a policy for free primary education increases the number of primary school graduates and decreases their relative wages, $y_{1,i}/y_{1,i}$. Therefore, the wages of untreated individuals may be affected by the policy. Moreover, to cover the policy cost, more educated workers may pay more taxes, and this may affect their schooling behavior as well. A general equilibrium analysis accounts for these effects.

Heckman, Lochner, and Taber (1998) analyzed the effects of changes in tuition on schooling and earnings, accounting for general equilibrium on skill prices. They assumed that different schooling levels correspond to different skills, for which prices are endogenously determined. Individuals differ both in learning and in initial endowments of human capital. They argued that using a general equilibrium framework reduces the effect of a revenue-neutral $500 college tuition subsidy from 5.3 percent to a mere 0.46 percent.

The ideal data set for the purpose of this study would be a combination of micro-level data on firms, earnings of workers, the life-cycle consumption of the workers, and their wealth assets, as well as macroeconomic data on prices and aggregates. With such data, we could estimate the distribution of wages, wealth, and earnings. Using the microdata along with aggregate prices, we could construct aggregates of human capital and determine the output technology. With the lack of information on individual consumption, labor earnings, and skill prices, I assume that the returns to educations are stable. The general equilibrium effects of the policy for free primary education in Benin may be limited since more than

two-thirds of the workforce is active in the informal sector—the sector that values education the least.

Expanding education up to five years may not be enough to move people into the modern/urban sector since the average educational attainment in the sample is 12 years for the public sector and nine years for the formal private sector. However, this could make people a little more productive in agriculture, but there is not enough information to estimate returns to education in the agricultural sector.

Data Description

Education and Household Data

The data set compiled from the education statistical yearbooks, published by the Ministry of Education, includes yearly education outcomes and inputs in a panel for 77 municipalities from 2005 to 2011. I linked these data to sociodemographic and community characteristics from the 2002 population census and the 2006 and 2011 DHS. Following Lucas and Mbiti (2012), I also assume that municipalities with higher dropout rates before 2006 will experience a larger impact from the policy, therefore providing a measure of the intensity of the treatment in each municipality.

For the 2006 DHS, the field data collection was done between August 3 and November 18, 2006, a month after the policy went into force. The second survey is the 2011 DHS, for which the data was collected between December 2011 and March 2012, is the microdata of the analysis of the determinants across gender, regions, and wealth level between 2006 and 2011, conditional on household characteristics. Lincove (2009) and Grogan (2009) used similar household surveys to assess the effects of free primary schools.

The descriptive statistics in Table 4.2 show an increase in the student–teacher ratio, on average, from 45 to 48 students. The average probability of passing the national primary school exit exam (CEP) has decreased from 78 percent to 62 percent between 2006 and 2010.

Earning Data

I use a rich data set to estimate returns to schooling in Benin, testing a variety of econometric models. The data is from the 1–2–3 surveys, conducted in Cotonou in 2002, by INSAE, the National Institute of

Table 4.2 Summary statistics of passing the CEP*

	2006		*2010*	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*
CEP rate	0.778	0.112	0.624	0.178
Log-odds of CEP rate	1.389	0.733	0.554	0.758
Initial log-odds of CEP rate (2005)	2.809	0.661	2.809	0.661
Student-to-teacher ratio	45.349	5.307	47.642	7.461
Intensity of FPE	0	0	0.396	0.189
Northern region	0.351	0.480		
Qualified teachers (%)	0.453	0.070	0.440	0.066
Per capita expenditure	197,590	94,053	182,604	70,890
Center region	0.312	0.466	0.312	0.466
Southern region	0.455	0.501	0.455	0.501
Male population 2002	0.485	0.013	0.485	0.013

Source: Author's construction based on data from Ministry of Education's statistical yearbooks (2005–2010)

(*) Note: The CEP is the national primary school exit exam

Statistics in Benin. The 1–2–3 surveys have three phases: employment, informal sector, and consumption. This chapter mainly uses the first phase (employment and earnings), with information on individuals' sociodemographic characteristics (including education and literacy), labor market integration (supply of labor, pay, professional mobility), and working conditions (premises, working hours). The data set has about 3000 household and 5285 individual observations (Razafindrakoto et al. 2009).

The labor market outcome variable, individual earnings, is not easily measured here since a large proportion of workers are in the informal sector, in which there are no accounts or payslips. The 1–2–3 surveys provide an estimate of the total benefits relating to the job (sundry bonuses, paid holidays, housing, in-kind benefits, etc.), whether monetary or non–monetary, which are added to the direct income. Two strategies were adopted in the 1–2–3 surveys to address the issue of measurement errors, particularly in the informal sector. First, for nonwage earners (self-employed and employers), the interviewers helped them reconstitute their earnings by recapitulating incoming and outgoing money over a reference period. Then, nonwage earners' incomes were translated into monthly sums in the questionnaire. The monthly income can then be divided by the number of hours worked per month, available from both phases 1 and 2 of the 1–2–3 surveys, to obtain hourly earnings. Second, the individuals who were

Table 4.3 Summary statistics for paid-work participants

Variable	*Mean*	*Std. Dev.*
Log of hourly earnings—all sectors	4.845	1.230
Log of hourly earnings—public sector	5.728	1.176
Log of hourly earnings—formal private sector	5.162	1.288
Log of hourly earnings—informal sector	4.627	1.174
Years of completed education	7.782	4.364
Experience	14.154	14.561
Female	0.517	0.500
Rural migrants	0.165	0.372
Urban migrants	0.244	0.430
Foreign	0.050	0.218
Muslim	0.110	0.313
Christian	0.820	0.384
Other religion	0.107	0.309
Dependence ratio	0.308	0.319
Years of schooling	8.294	4.268
Father's education	1.158	1.292
Father is executive	0.152	0.359
Father is wage employee	0.175	0.380
Father is self-employed	0.430	0.495
Father's profession not available	0.243	0.429
Income earner	0.579	0.494

Source: Author's construction based on data from the INSAE's 1–2–3 survey in 2002

unable or unwilling to disclose their exact earnings were asked to select an income bracket. Seven brackets were defined by multiples of the minimum wage in force. One could use the imputation method to deal with this kind of information, but for this chapter, these observations were ignored.

Summary statistics are reported in Table 4.3. The number of working individuals at least 15 years old in the sample is 2885, mainly comprised of informal sector workers. The public sector accounts for only 10 percent of the sample, the formal private sector for 25 percent, and the informal sector for 65 percent.

The accumulation of education is quite low, with the average number of years of completed schooling about eight years. About 24 percent have never attended school, and if we include those who attended school but

did not complete the primary cycle, the number is 29 percent of the sample. Assuming that people are literate when they have completed primary school, only 61 percent of individuals aged 15 and over are able to read and write.

A public sector worker has completed, on average, 12 years of schooling while in the informal sector, the average is only 6 years of schooling. A formal private sector worker has completed, on average, 9 years of schooling.

Measurement errors are an issue for non-salaried workers, particularly in the informal sector. The evaluated nonwage earners' incomes were translated into monthly sums in the questionnaire. This monthly (net) income was then divided by the number of hours worked per month to obtain hourly earnings.

The average monthly earnings for individuals aged 15 and over in Benin are 51,450 CFA francs (79 euros). A breakdown by sector also reveals substantial earnings differences. Public sector workers earn an average of 84,200 CFA francs (€129) per month, which is more than double the earnings of informal sector workers, who earn just 38,578 CFA francs (€59) per month. Formal private sector workers are also high earners, of an average of 77,645 CFA francs (€119) per month.

The ranking of the sectors based on average earnings is, therefore, similar to that of the average years of schooling, suggesting a positive correlation between years of schooling and monthly earnings.

Effect of Free Primary Education on Access to Education and Student Performance

The econometrical analysis suggests an attenuation of the inequality of access, but the disparities in student performance remain prevalent.

An Attenuation of the Inequality of Access to Education

Descriptive evidence suggests a positive effect of the free tuition policy on enrollment, especially for the poor, for girls, and for students in the northern region. Table 4.4 shows the attendance rates for girls and boys by quintile of the per capita income for the families of the cohort of 6- to 11-year-old students.

Table 4.4 Attendance rates for girls and boys by quintile of the per capita income for families of 6–11-year-old students (2006 and 2011)

2006	All			Boys			Girls		
	Obs.	*Mean*	*Std. Dev.*	*Obs.*	*Mean*	*Std. Dev.*	*Obs.*	*Mean*	*Std. Dev.*
Q1	4073	0.392	0.488	2210	0.443	0.497	1863	0.332	0.471
Q2	3933	0.515	0.500	2054	0.547	0.498	1879	0.481	0.500
Q3	3756	0.627	0.484	1965	0.650	0.477	1791	0.601	0.490
Q4	3371	0.738	0.440	1721	0.766	0.423	1650	0.709	0.454
Q5	2750	0.837	0.369	1359	0.893	0.309	1391	0.782	0.413
All	*17,883*	*0.602*	*0.489*	*9309*	*0.635*	*0.481*	*8574*	*0.566*	*0.496*
2011	**All**			**Boys**			**Girls**		
	Obs.	*Mean*	*Std. Dev.*	*Obs.*	*Mean*	*Std. Dev.*	*Obs.*	*Mean*	*Std. Dev.*
Q1	5572	0.645	0.479	2983	0.674	0.469	2589	0.611	0.488
Q2	5466	0.695	0.460	2977	0.727	0.446	2489	0.658	0.475
Q3	4989	0.738	0.440	2623	0.756	0.429	2366	0.719	0.450
Q4	4344	0.788	0.409	2236	0.795	0.404	2108	0.781	0.414
Q5	2975	0.818	0.386	1470	0.854	0.353	1505	0.783	0.412
All	*23,346*	*0.725*	*0.446*	*12,289*	*0.748*	*0.434*	*11,057*	*0.700*	*0.458*

Source: Author's construction based on DHS data (2006 and 2011)

The differences between poor and rich have significantly narrowed between 2006 and 2011. This suggests a significant effect of free tuition on the poor. In 2006, attendance in the bottom quintile was only about 39 percent, as compared to 84 percent for the top quintile, a difference of 45 points. By 2011, differences in attendance based on income had narrowed: primary attendance has increased relatively to 65 percent for the bottom quintile, which is significantly closer to 82 percent achieved by the top quintile. Only 17 points separate the bottom and top quintiles.

The catchup has been more visible for girls. The poorest quintile has almost doubled girls' attendance from 33 percent to 61 percent while the richest quintile has only increased girls' attendance from 61 percent to 78 percent.

Table 4.5 shows the changes in attendance by place of residence of the children. As expected, the rural areas have experienced the most increase in the attendance rate following the free tuition policy for the 6- to 11-year-old children, who have been fully exposed to the policy change. The 12- to 18-year-old population has experienced a decrease in enrollment, because most of them are able to enroll early in primary school with this policy, and later age enrollments are on the decline. The northern region, even with some increase in attendance, is still lagging behind the

Table 4.5 School attendance among 6–18-year-old children (2006 and 2011)

	All Benin	*Urban*	*Rural*	*North*	*Center*	*South*
2006						
Children ages 6–11 in primary school (%)	0.602	0.704	0.546	0.483	0.694	0.666
Children ages 12–18 in primary school (%)	0.315	0.272	0.345	0.266	0.304	0.336
2011						
Children ages 6–11 in primary school (%)	0.725	0.779	0.702	0.572	0.823	0.801
Children ages 12–18 in primary school (%)	0.240	0.198	0.261	0.238	0.225	0.238

Source: Author's construction based on DHS data (2006 and 2011)

center and the southern regions, which both attained the 80 percent mark in 2011.

However, the universal primary education goal has not yet been achieved. A possible explanation lies in the importance of the indirect opportunity costs of schooling, in terms of foregone income, which might deter parents from sending their children to school, even with free tuition. To explore this hypothesis further and confirm the descriptive analysis, I estimate a logit model.

The regression results from Table 4.6 suggest that FPE has reduced the income effect on the odds of enrollment in primary school and reduced the incidence of direct and indirect costs of schooling on the odds of enrollment in primary schools.

In 2006, the literacy rate has a positive impact while family size and the proportion of private schools in the municipality have a strong negative impact on the odds of enrolling children in primary education. The proportion of private schools here is used to capture the extent of the direct cost of schooling. However, the literacy rate and the share of private schools are not significant in explaining the odds of a child enrolling in primary school in 2010, suggesting that the poverty explanation for the low enrollment rate might be valid in Benin. Yet, family size still negatively affects the odds of enrollment.

The indirect costs or opportunity costs of schooling captured here by the proportion of 12- to 14-year-old students are statistically significant. The enrollment data obtained from the Ministry of Education in Benin include 16 percent of municipalities in 2006 and 33 percent of municipalities

Table 4.6 Determinants of net enrollment rate in Benin (municipal level)

	Odds ratio from ministry education		*Corrected odds ratio*		*Odds ratio from survey*	
	2006	*2010*	*2006*	*2010*	*2006*	*2010*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Literacy rate	2.012*	−0.395	4.032***	2.801***	4.332***	4.309***
	(1.156)	(1.335)	(0.793)	(0.928)	(0.701)	(0.578)
Family size	−0.375**	−0.529***	−0.217**	−0.176	−0.145	−0.27***
	(0.141)	(0.171)	(0.0988)	(0.135)	(0.0896)	(0.0767)
Pop. aged 12–14	−1.222**	−1.653***	−1.667***	−2.95***	−0.876***	−0.97***
	(0.487)	(0.536)	(0.362)	(0.435)	(0.323)	(0.261)
Share private schools	−2.763**	−0.282	−2.606***	−0.378	−1.770**	−0.900
	(1.234)	(1.609)	(0.898)	(1.289)	(0.790)	(0.778)
Log # schools	1.310**	1.526**	0.991**	2.620***	−0.723	0.555*
	(0.652)	(0.644)	(0.494)	(0.493)	(0.436)	(0.316)
Log pop. density	−0.0829	−0.00684	0.206**	0.142	0.154**	0.0523
	(0.117)	(0.144)	(0.0809)	(0.105)	(0.0729)	(0.0646)
Log community teachers	0.267	0.127	0.101	−0.0137	0.921***	0.140
	(0.448)	(0.188)	(0.345)	(0.140)	(0.302)	(0.0913)
Intercept	7.412***	11.99***	9.760***	15.08***	6.492***	6.640***
	(2.528)	(2.555)	(1.914)	(2.068)	(1.699)	(1.290)
N	65	52	75	67	77	77
R^2	0.467	0.473	0.626	0.630	0.626	0.726

Source: Author's construction

Note: Standard errors in parentheses. The unit of observation is the municipality. Columns 1 and 2 are the enrollment rate from the Ministry of Education, dropping rates that are higher than 100%. Columns 3 and 4 are corrected rates, based on enrollments and population projects. Columns 5 and 6 use the enrollment rates estimated by the Statistical Bureau INSAE, based on Household Surveys in primary school. For Columns 2, the sample is limited to 6–11-year-olds, the official school-age range for primary school. Column 3 uses the sample of 12–18-year-olds (late enrollment)

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

in 2009, with a net enrollment rate abnormally greater than 1 (Ministere de l'Education Nationale 2009). To account for this problem, I explore alternative measures of enrollment: the corrected enrollment rate and the enrollment rate from the surveys. Using those two alternative measures has changed the conclusions regarding the literacy rate. The literacy rate is now significant in both years. However, the influence of the literacy rate on enrollment probability was smaller in 2010 than in 2006.

The individual-level analysis in Table 4.7 is consistent with the conclusions from the municipal-level regression. The conclusions about the share of private schools remain similar as it affects significantly the odds of enrollment in 2006, but not in 2010. The literacy rate remains an important determinant of the odds of enrolling in primary education.

The significant reduction of the influence of family background (education, female head of household), direct costs of schooling, and being a male child on the probability of enrollment suggests that the abolition of primary school tuition has attenuated the inequality of access to primary schools for the poor, the girls, and the children from the northern region of the country.

A Prevalent Inequality of Student Performance

With respect to student performance, there may be a trade-off between broad access and quality improvements. To evaluate this possibility, I analyzed the national exit exam (CEP) data across municipalities. The data lacks any measure of student abilities. To control for students' backgrounds, I use the initial level of the dependent variable in 2005 and the percentage of males in the municipality.

For the school environment, the controls include the student–teacher ratio and the percentage of qualified teachers. In the case of Benin, a qualified primary school teacher is any holder of a diploma from a school of education or a school known for training teachers. Additional variables that describe school facilities are the numbers of potential seats, the number of seated students, the importance of private schools, and the percentage change in the enrollment rate, which measures the intensity of the policy on the municipality between 2006 and 2010–2011.

The variables representing parental education, income, and family size are also controlled for in the model. I have also included regional dummy variables to control for geographical disparities (north, center, and south).

In terms of quality, Table 4.8 shows that increased enrollment has only a limited effect on student's performance. The 2010 dummy variable is

Table 4.7 Determinants of child enrollment in primary school (individual level)

	The dependent variable is child enrollment status in primary school					
	Full sample		*6–11 year-olds*		*12–18 years-olds*	
	(1)		*(2)*		*(3)*	
Male child	0.346***	(0.0262)	0.339***	(0.0324)	0.345***	(0.0405)
Log household per capita expenditure	0.122***	(0.0222)	0.0678**	(0.0277)	0.165***	(0.0326)
Female head of household	0.363***	(0.0369)	0.551***	(0.0470)	0.095*	(0.0524)
Child in farm or household production	0.181***	(0.0278)	0.143***	(0.0338)	0.321***	(0.0447)
Education attainment head of household	0.0824***	(0.0036)	0.170***	(0.0054)	−0.041***	(0.00494)
Age 10–14 dummy	−0.071***	(0.0264)	0.505***	(0.0367)	1.796***	(0.0441)
Male*2011	−0.156***	(0.0355)	−0.0582	(0.0443)	−0.33***	(0.0557)
Log household per capita expenditure*2011	−0.0314	(0.0316)	0.216***	(0.0404)	−0.45***	(0.0478)
Female head of household*2011	0.0287	(0.0498)	0.0795	(0.0654)	−0.0459	(0.0718)
Child in farm or household production*2011	−0.521	(0.665)	−0.537	(0.826)		
Education attainment head of household*2011	−0.043***	(0.0051)	−0.060***	(0.0077)	−0.0093	(0.00754)
Age 10–14 dummy*2011	−0.859***	(0.0359)	−0.777***	(0.0488)	0.291***	(0.0629)
2011 dummy	−0.148	(0.270)	−2.443***	(0.354)	3.072***	(0.424)
Constant	−0.140***	(0.0375)	−0.356***	(0.0450)	−2.06***	(0.0652)
N	56,655		40,485		31,742	
R^2 pseudo	0.0386		0.0665		0.1493	
Log-likelihood	−36567.7		−23970.5		−15835.6	

Source: Author's construction

Note: Standard errors in parentheses. The unit of observation is the child enrollment status. For Column 1, the sample includes children of all ages in primary school. For Column 2, the sample is limited to 6–11-year-old children, the official school-age range for primary school. Column 3 uses the sample of 12–18-year-olds (late enrollment)

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 4.8 Effects of FPE on municipality CEP passing rate

	The dependent variable is log-odds of CEP passing rate			
	Full sample		*Top 50% in 2005*	
	(1)	*(2)*	*(3)*	*(4)*
Initial log-odds of CEP Pass rate (2005)	0.244** (0.115)	0.214* (0.110)	0.303 (0.274)	0.353 (0.265)
2010 dummy (policy)	−1.053 (0.997)		−0.897 (1.847)	
Initial log-odd CEP * 2010 dummy	0.0432 (0.162)		0.00586 (0.378)	
Student-to-teacher Ratio	−0.0500*** (0.0143)	−0.0487*** (0.0131)	−0.0454** (0.0207)	−0.0370* (0.0188)
Student-to-teacher Ratio * 2010 dummy	0.00444 (0.0175)		0.000882 (0.0246)	
Intensity of policy		−3.635* (1.973)		−2.233 (4.251)
Initial log-odd CEP * Intensity of policy		0.109 (0.307)		−0.144 (0.893)
Student-to-teacher Ratio * intensity		0.0395 (0.0353)		0.0219 (0.0537)
Constant term	2.971*** (0.772)	2.909*** (0.723)	2.607* (1.500)	1.949 (1.363)
N	154	154	78	78
R^2	0.434	0.398	0.434	0.361

Source: Author's construction

Note: Standard errors in parentheses. The unit of observations is the municipality. Columns 1 and 3 use year 2010 as the policy variable, while columns 2 and 4 use the policy intensity measure (percentage change in municipality enrollments) as the policy variable

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

significant, suggesting a general decreasing trend of student performance. However, when using the intensity variable, the effect of the policy is not significant when additional controls are included. Another interesting result is that when the sample is limited to the municipalities that were performing above the median in 2005, the effect of FPE on enrollment becomes nonsignificant, suggesting that FPE does not have a deteriorating effect on the quality of learning in municipalities that were top performers (top 50 percent) in 2005. If making schooling more affordable and available can close the education disparities without negatively

Table 4.9 Effects of FPE on determinants of municipality CEP passing rate

	The dependent variable is log-odds of CEP passing rate, using alternative policy variables	
	Year 2010 dummy	*FPE intensity*
Initial log-odds of CEP pass rate (2005)	0.270***	0.229***
Policy variable	−9.422*	−12.73
Student-to-teacher ratio	−0.0642***	−0.0548***
Student-to-teacher ratio * FPE variable	0.0499***	0.118***
Qualified teachers (%)	−0.773*	−0.742*
Qualified teachers * FPE (%)	0.621	−1.296
Male proportion	13.16**	14.41**
Male proportion * FPE	−7.588	−28.96
Log of per capita expenditure	−0.606***	−0.438**
Log of per capita expenditure * FPE	0.893***	1.552**
Northern region dummy	−0.342*	−0.366**
Northern region * FPE	−0.773***	−0.877
Constant	4.003	0.997
N	154	154
R^2	0.629	0.580

Source: Author's construction

Notes: The unit of observations is the municipality. Column 1 uses year 2010 as the policy variable, while column 2 uses the policy intensity measure (percentage change in municipality enrollments) as the policy variable

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

affecting quality, Benin's experience in promoting human capital may have important policy implications for other developing countries. The results suggest that there is welfare improvement, as traditionally disadvantaged groups experience catch-up, becoming better in terms of education access, without making top performers worse in terms of quality.

Table 4.9 shows the determinants of the passing rate. The student–teacher ratio has a significantly negative impact on the passing rate both before and after the policy, suggesting that it is a key variable, along with the family income. The interaction between the per capita expenditure and the FPE variable remains significant.

These results show that the factors that affected quality before the policy change continue to be relevant after the policy was implemented. In particular, student socioeconomic characteristics are still important determinants of student performance. The result suggests that the inequality in

education has moved somewhat from access to quality. In fact, the importance of family background and direct costs of schooling on enrollment has been significantly reduced after the policy. However, student socioeconomic characteristics remain important determinants of student performance on the national primary school exit exam.

Education and Earnings

To understand how education is related to earnings, I first estimate an earnings equation for all the sectors together. Then, I account for selectivity in paid work and endogeneity of education.

Earnings Function Specifications

The baseline model is an ordinary least squares (OLS) empirical specification, in which lny_i is the natural logarithm of the hourly wage. The explanatory variables are years of schooling and other covariates X to control for individual and job characteristics, such as marital status, potential experience, gender, and the employment sector. There is a linear and a quadratic term in potential experience, which is defined as age, less the years of schooling minus six (Mincer 1974).

The OLS results are summarized in Table 4.10. The regression coefficient for education is positive and significant. According to Regression (1) in the table, if an individual with the average years of schooling acquires 1 additional year of education, this will increase his/her hourly wage by 8.7 percent. The dummy for the public sector is also significantly positive, suggesting a positive hourly wage differential of 33 percent, compared to the private sector.

The significantly negative female dummy variable indicates that women's hourly wage is on average 49 percent lower than that of their male counterparts.

Correction for Selectivity into Paid Work

Since individuals may self-select into employment, I account for sample selection by using the Heckman selection procedure. The first stage of the Heckman sample selection model for all sectors together shows a nonsignificant probit model, with the inverse Mill's ratio having a p-value of 40 percent. This suggests that the allocation into the two groups (paid-work

participants vs. nonparticipants) is somewhat random and may not affect earnings when using a pooled population across different sectors of activity. In other words, paid work participation is associated with unobserved characteristics that are not correlated with earnings. It is, therefore, not surprising that the estimates for education and education squared are very close to the OLS results (column 6, Table 4.10).

Endogeneity of Education with Selectivity

To account for any potential endogeneity of education, I re-estimate the equations by using the father's education and the father's work categories as instruments for the individual's education. More specifically, I consider the father's education as a continuous variable, with three dummies for his work status, that is, self-employed, unskilled wage employee, and executive or manager. The joint *F*-test of significance shows that the father's characteristics are significant in the first-stage regression wherein education is regressed on all exogenous variables, suggesting that the exogeneity assumption can be rejected.

Using the predicted education in the selectivity model leaves the estimated returns to education unchanged in the pooled population across sectors. This result is not surprising since the Mills ratio is still nonsignificant for the pooled model. The result is similar to Oyelere (2010), who found no significant differences between OLS and IV estimates of returns to education in Nigeria when necessary controls are included in the wage equation.

Overall, accounting for selectivity and endogeneity of the schooling does not affect significantly the estimated returns to education. The income inequality analysis in the following section is based only on the OLS results.

Analysis of Inequality

With the positive effect of the free primary education policy on enrollment, education attainment will potentially increase, particularly, for traditionally disadvantaged groups (females, poor, rural). Since returns to education are positive in Benin, one would expect a more homogeneous distribution of schooling attainment, which might translate into a more equally distributed wage.

Table 4.10 OLS and Heckman Method

	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled OLS	*Pooled OLS*	*OLS-Public*	*OLS-private*	*First-stage pooled Heckman (positive revenue)*	*Second-stage pooled Heckman*
Education	0.0885***	0.0870***	0.0896***	0.0848***	0.0189***	0.0888***
	(0.0103)	(0.00595)	(0.0148)	(0.00654)	(0.00560)	(0.00601)
Experience	0.0866***	0.0357***	0.0936***	0.0255***	0.0231***	0.0392***
	(0.0141)	(0.00809)	(0.0217)	(0.00873)	(0.00763)	(0.00822)
Experience squared	−0.001***	−0.0005***	−0.002***	−0.0003**	−0.000180	−0.0006***
	(0.000250)	(0.00015)	(0.00042)	(0.00016)	(0.00014)	(0.00015)
Female	−0.558***	−0.492***	−0.143	−0.540***	−0.239***	−0.513***
	(0.0869)	(0.0476)	(0.135)	(0.0509)	(0.0469)	(0.0484)
Married	0.411***	0.136**	0.355**	0.131**	−0.253***	0.154***
	(0.103)	(0.0550)	(0.175)	(0.0579)	(0.0577)	(0.0556)
Public sector		0.331***				0.329***
		(0.0728)				(0.0726)
Dependency ratio					1.639***	3.754***
					(0.0604)	(0.129)
Constant	1.252***	3.928***	3.277***	4.088***	−1.578***	
	(0.182)	(0.110)	(0.325)	(0.120)	(0.107)	
N	3680	2167	292	1875		3733
R^2	0.067	0.212	0.205	0.166		

Source: Author's construction

Note: Standard errors in parentheses. Marital status also included
$*p < 0.10$, $**p < 0.05$, $***p < 0.01$

Measures of Inequality

Using inequality measures with the wage equation estimated earlier, I now turn to simulating the magnitude of future changes. I use two complementary inequality measures: the Gini coefficient and the quantile ratio 90/10.

The 90/10 ratio compares the 90th percentile to the 10th percentile of the income distribution. For example, a 90/10 ratio of 2 suggests that the poorest person of the richest 10 percent of the population earns twice as much as the richest person of the poorest 10 percent. Even though the 90/10 ratio is robust to outliers of the wage distribution, it does not reflect any change in inequality between the 11th and the 89th percentiles.

On the other hand, the Gini coefficient is more sensitive to changes in the middle of the distribution and complements well the analysis of the 90/10 ratio.

The Gini coefficient is given by:

$$Gini = \frac{2}{\mu n^2} \sum_{i=1}^{n} \left(r_i - \frac{n+1}{2} \right) W_i, \tag{4.4}$$

where n is the number of observations, each individual i earning wage W_i. The mean wage is μ, and r_i is the rank of individual i in increasing order of wages.

The Gini coefficient is bounded between 0 and 1, with 0 indicating absolute equality and 1 indicating absolute inequality.

Hypotheses and Scenarios

In order to simulate potential inequality of wages, I first assume that each education level earns the same hourly wage, so that the variation in wage only arises from variation in worked hours. I randomly draw future hours worked from a normal distribution with the empirical mean of 46.5 hours per week and standard deviation of 17.2, calculated from the data.

I consider two scenarios for future changes in educational attainment to simulate changes in wages. In the first scenario, I assume:

- no additional schooling for individuals who have completed at least 18 years of schooling;
- one additional year of schooling for those with 13–17 years of schooling;

- two additional years of schooling for those with 10–13 years of schooling;
- three total years of schooling for those with less than three years of schooling;
- six total years of schooling for those with 3–6 years of schooling.

In the second scenario the assumptions are stronger and are as follows:

- no additional schooling for those who have completed at least 18 years of schooling;
- two additional years of schooling for those with 13–17 years of schooling;
- four additional years of schooling for those with 10–13 years of schooling;
- ten total years of total schooling for those with less than 3 years of schooling;
- six total years of schooling for those with 3–6 years of schooling.

Simulation of Wage Inequality

Changes in Inequality of Wages

I rely on two reference samples: the first one is the 1–2–3 data used to estimate the wage equation itself, while the second one is based on the urban sample of the 2006 DHS.

The simulations results are summarized in Table 4.11. The initial scenarios are obtained by using the observed data on the covariates to predict the wage, using the Mincer equation. The same approach is used to simulate the predicted wages in scenarios 1 and 2. For each scenario, the standard deviation and the Gini coefficient of the educational attainment are calculated to assess the magnitude of the hypothesized changes in years of schooling. From the initial state to scenarios 1 and 2, the assumptions translate into higher education measured as average schooling level and into a more equal distribution of the educational attainment. Both the standard deviation and the Gini coefficient of years of schooling decrease from the initial state to scenarios 1 and 2 for the 1–2–3 survey and the urban sample of the DHS data, both used as reference data.

The 90/10 ratio and the Gini coefficient are also calculated for each scenario. Overall, the hypothesized increased educational attainment leads

Table 4.11 Simulations of inequality of wages assuming constant return to education by educational attainment

	Panel A Using 1–2–3 survey			*Panel B Using Urban DHS*		
	Initial	*Scenario 1*	*Scenario 2*	*Initial*	*Scenario 1*	*Scenario 2*
Average schooling	7.78	9.75	12.22	1.319	4.214	6.729
Std. Dev. of schooling	4.36	4.12	3.64	3.502	3.199	2.471
Gini coefficient of schooling	0.31	0.275	0.16	0.926	0.200	0.100
Average wage	8375.0	9466.9	1437.6	3878.8	4851.5	6021.9
Std. Dev. of wage	6747.8	7117.9	8219.3	2118.7	2556.1	3156.3
Gini coefficient of wage	0.385	0.372	0.367	0.292	0.287	0.286
Std. error of Gini coefficient	0.004	0.004	0.005	0.001	0.001	0.001
10th percentile wage	2692.9	3099.3	3736.2	1615.8	2048.7	2543.1
90th percentile wage	16,210.0	18,189.0	22,187.0	6647.7	8314.7	10,346.4
90–10 ratio wage	6.024	5.873	5.944	4.115	4.059	4.069

Source: Author's construction

Note: The simulations of inequality analysis use the scenario of future changes in educational attainment to evaluate the impact of the policy on wage inequality. Panel A is based on the 2002 data from the 1–2–3 survey as reference and Panel B is based on the 2006 DHS data. Scenario 2 assumes a larger equalization of education distribution

to higher average wages and to a decreasing standard deviation in both scenarios.

Using the 1–2–3 sample as a reference, the Gini coefficient decreased from 0.385 in the initial state to 0.372 in scenario 1 and to 0.367 in scenario 2, suggesting only a small decrease in inequality. The trend is not monotonic with the 90/10 ratio, which has changed from 6.024 to 5.873 and to 5.944. The more erratic evolution of the 90/10 ratio suggests some changes in the tails of the wage distribution over time. These results are consistent with changes recently published by the National Institute of Statistics in Benin, which documented a Gini coefficient of consumption expenditures changing only marginally from 0.472 in 2007 to 0.469 in 2011 (INSAE 2012).

With the 2006 DHS data, the Gini coefficient shows a similar decrease with 0.292 in the initial sample, 0.287 in scenario 1, and 0.286 in scenario 2. Similar to the 1–2–3 data, the 90/10 ratio shows some changes in the tails of the distribution, with the ratio moving from an initial 4.115 to 4.059 in scenario 1 and 4.069 in scenario 2.

Sensitivity Analysis

While the assumption of a constant predicted wage by educational attainment is a good starting point, it tends to underestimate the magnitude of the potential inequality. As a sensitivity analysis, I introduce more noise in the model by drawing a random error from a normal model, which is added to the predicted hourly wage to allow heterogeneity of wages within educational attainment levels. The results are summarized in Table 4.12.

As expected, the magnitude of the inequality measure across scenarios increased compared to results from Table 4.11. However, the trend remains similar to the results obtained by assuming constant wage by educational attainment for both the Gini coefficient and the 90/10 ratio. Together, these results suggest that the dynamics of the change in inequality over time are not sensitive to adding more variation to the relationship between wages and years of schooling.

Table 4.12 Simulations of inequality of wages assuming variable return to education by education attainment

	Panel A Using 1–2–3 survey			*Panel B Using Urban DHS*		
	Initial	*Scenario 1*	*Scenario 2*	*Initial*	*Scenario 1*	*Scenario 2*
Average schooling	7.782	9.754	12.215	1.319	4.214	6.729
Std. dev. of schooling	4.364	4.122	3.637	3.502	3.199	2.471
Gini coefficient of schooling	0.310	0.275	0.161	0.926	0.200	0.100
Average wage	14,795.1	16,720.1	20,176.2	6870.3	6993.1	8670.9
Std. dev. of wage	29,439.7	32,280.9	38,102.3	11,984.0	12,561.2	15,505.3
Gini coefficient of wage	0.636	0.631	0.628	0.605	0.613	0.611
Std. error of Gini coefficient	0.012	0.012	0.013	0.004	0.003	0.003
10th percentile wage	1201.2	1392.4	1693.1	659.4	635.4	803.3
90th percentile wage	33,761.6	38,298.0	46,377.5	15,718.2	16,046.3	19,871.9
90–10 ratio wage	28.169	27.568	27.482	23.845	25.256	24.742

Source: Author's construction

Note: A random normal error term is added to the predicted log (wage) to allow for heterogenous returns to a given level of education. The simulations of inequality analysis use the scenario of future changes in educational attainment to evaluate the impact of the policy on wage inequality. Panel A is based on the 2002 data from the 1–2–3 survey as reference and Panel B is based on the 2006 DHS data. Scenario 2 assumes a larger equalization of education distribution

Simulating General Equilibrium Effects

With the increase in the number of workers with higher educational attainment, I assume alternative percentages of decrease in the return to one additional year of schooling. In practice, this hypothesis translates into a decrease of the coefficient on the schooling variable in the Mincerian wage equation by 5 percent, 10 percent, or 20 percent. I use these numbers to simulate the impact of these general equilibrium effects on the inequality analysis of wages.

In the first case considered, the return to education decreases by 5 percent in scenario 1, corresponding to a modest increase in educational attainment and by 10 percent in scenario 2, when the change in educational attainment is more important. In the second case, I use a decrease of 10 percent in scenario 1 and 20 percent in scenario 2, respectively.

The results summarized in Tables 4.13 and 4.14 suggest that as educational attainment increases by 25 percent, the inequality of wages decreases more significantly from the initial state to scenario 1 and to scenario 2. For example, when using the 1–2–3 dataset as a baseline, the Gini coefficient decreases by about two percentage points from 0.385 to 0.366 and to 0.347. When the decrease in scenario 2 is limited to only 10 percent, the Gini coefficient decreases less to 0.357, compared to 0.347 for the 20 percent decrease. These conclusions suggest that the wage inequality seems to decline more notably, as the importance of education for wages becomes less significant, than other determinants when education opportunities are more available. In terms of magnitude, these changes are limited. In comparison, data available from the World Development Indicators between 2005 and 2014 suggest that the average Gini coefficient in sub-Saharan African countries is 0.442, with a standard deviation of 0.09, which is much larger than the 0.01–0.02 reduction in wage inequality seen in the simulations.

Given the mobility of educated workers within the country, it is reasonable to assume that the average effect of education on wages is the same throughout the country in urban areas. As education becomes more affordable, general equilibrium effects may reduce the scope by which workers living in urban areas gain from their education, reducing the inequality of wages.

Conclusion

In 2006, Benin implemented a free primary education (FPE) policy by eliminating fees paid by parents in all public schools. The analyses of municipal and household-level data suggest a positive effect of the policy

Table 4.13 Simulations of inequality of wages, assuming a general equilibrium decrease of the average return to education (10% and 20%)

	Panel A Using 1–2–3 survey			*Panel B Using Urban DHS*		
	Initial	*Scenario 1 (5% decrease)*	*Scenario 2 (20% decrease)*	*Initial*	*Scenario 1 (5% decrease)*	*Scenario 2 (20% decrease)*
Average schooling	7.782	9.754	12.215	1.319	4.214	6.729
Std. dev. of schooling	4.364	4.122	3.637	3.502	3.199	2.471
Gini coefficient of schooling	0.310	0.275	0.161	0.926	0.200	0.100
Average wage	8375.0	8987.0	8973.5	3878.8	4748.8	5324.6
Std. dev. of wage	6747.8	6599.2	6004.1	2118.7	2472.6	2738.9
Gini coefficient of wage	0.385	0.366	0.347	0.292	0.284	0.282
Std. error of Gini coefficient	0.004	0.004	0.005	0.001	0.001	0.001
10th percentile wage	2692.9	3004.6	3134.2	1615.8	2016.6	2273.4
90th percentile wage	16,210.0	17,112.0	16,879.3	6647.7	8108.9	9078.6
90–10 ratio wage	6.024	5.699	5.391	4.115	4.021	3.994

Source: Author's construction

Note: I assume that general equilibrium effects lead to a decrease in returns to education by 5% in scenario 1 and 20% in scenario 2, assuming constant return for each education level. The simulations of inequality analysis uses the scenario of future changes in educational attainment to evaluate the impact of the policy on wage inequality. Panel A is based on the 2002 data from the 1–2–3 survey as reference, and Panel B is based on the 2006 DHS data. Scenario 2 assumes a larger equalization of education distribution

on enrollment, especially for the poor, the girls, and in the northern region. However, the country is still a long way from its goal of universal primary education. There is some evidence that opportunity costs of schooling, in terms of foregone income, could continue to deter parents from sending their children to school, even with the FPE policy. I also found that the policy significantly reduced the influence of parental income and literacy on the probability of enrollment between 2006 and 2011, lending support to the poverty explanation of non-enrollment. However, parental literacy and income still determine student performance, as measured by the CEP passing rate.

Table 4.14 Simulations of inequality of wages, assuming a general equilibrium decrease of the average return to education (5% and 10%)

	Panel A Using 1–2–3 survey			*Panel B Using Urban DHS*		
	Initial	*Scenario 1 (5% decrease)*	*Scenario 2 (10% decrease)*	*Initial*	*Scenario 1 (5% decrease)*	*Scenario 2 (10% decrease)*
Average schooling	7.782	9.754	12.215	1.319	4.214	6.729
Std. dev. of schooling	4.364	4.122	3.637	3.502	3.199	2.471
Gini coefficient of schooling	0.310	0.275	0.161	0.926	0.200	0.100
Average wage	8375.02	8986.96	10,123.42	3878.80	4748.82	5655.34
Std. dev. of wage	6747.77	6599.16	7018.17	2118.74	2472.60	2924.50
Gini coefficient of wage	0.385	0.366	0.357	0.292	0.284	0.283
Std. error of Gini coefficient	0.004	0.004	0.005	0.001	0.001	0.001
10th percentile wage	2692.92	3004.61	3423.24	1615.76	2016.64	2405.09
90th percentile wage	16,210.04	17,111.95	19,337.33	6647.72	8108.87	9668.43
90–10 ratio wage	6.024	5.70	5.65	4.115	4.02	4.02

Source: Author's construction

Note: I assume that general equilibrium effects lead to a decrease in returns to education by 5% in scenario 1 and 10% in scenario 2, assuming constant return for each education level. The simulations of inequality analysis uses the scenario of future changes in educational attainment to evaluate the impact of the policy on wage inequality. Panel A is based on the 2002 data from the 1–2–3 survey as reference, and Panel B is based on the 2006 DHS data. Scenario 2 assumes a larger equalization of education distribution

While the importance of family background on enrollment has been significantly reduced after the policy, socioeconomic characteristics remain important determinants of student performance. Hence, the inequality of access decreases, but the inequality in student performance across socioeconomic characteristics remains significant.

The increased educational attainment leads to higher average wages and to a decreasing dispersion across individuals. However, as the inequality of the distribution of schooling gets smaller, the simulated inequality of

wages displays only a very limited change after the free primary education policy. This stability in inequality may be due to smaller returns to primary education or to high negotiation power of union workers, a situation that may weaken the relationship between wages and educational attainment. As more schooling opportunities become available, more workers may be able to earn more years of schooling, and general equilibrium effects may decrease returns to education. The simulations of these possible effects translate into a slightly higher reduction of the inequality of wages.

Overall, the policy reduced inequality in years of schooling, potentially increasing average wage, with no worsening of the inequality of wages, suggesting some welfare improvement that may have important policy implications for Benin and other developing countries.

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CHAPTER 5

Education Driving Agriculture-Led Economic and Social Transformation in Africa

Frans Swanepoel, Aldo Stroebel, and Melody Mentz-Coetzee

Introduction and Background

Africa Today

Currently, there are 1.2 billion people in Africa, more than five times the population in 1950. By 2050, Africa's population will double to 2.4 billion, eventually reaching 4.2 billion by the end of the century—equal to about the entire world population of 1977 (UNICEF 2015).

Africa is also the world's most food insecure continent, with relatively low levels of agricultural productivity, low rural incomes, high rates of malnutrition, and a significantly declining food trade balance. In 2019 there

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were 422 million people in the sub-Saharan African region who were living in extreme poverty and surviving on less than US$1.90 per day (Hamel et al. 2019)—a surge from the 1990 figure of 290 million (Munang 2013).

Ironically, Africa has sufficient land, water, and human resources to contribute significantly to the world's food balance sheet. The continent has the potential to provide for the growing global demand for both food staples and higher value-added food, as well as to energy markets. Agriculture and the food sector also present significant opportunities for employment and wealth creation. Much of Africa's impressive economic growth has come from metals, minerals, and energy, with little impact on employment and improvement in the living conditions of the rural majority and poor urban dwellers, most of whom migrate from rural areas in search of better opportunities. Yet, agriculture and the food industry offer the prospect of rapidly increasing employment and incomes for the majority of the population (Jayne et al. 2017).

The critical role of agriculture in fostering sustained competitiveness and profitability in the face of a rapidly transforming world knowledge and network economy is acknowledged both within the scientific community and in governments at large (World Economic Forum 2013). In the past two decades, African governments and leaders have begun a number of regional and continental initiatives to facilitate and accelerate the much needed agricultural and rural transformation. Since 2003, under the Comprehensive Africa Agriculture Development Programme (CAADP 2003), many governments have increased their budgetary allocations to agriculture. Despite these changes, government agricultural expenditure (an average 3 percent of total public expenditure in the period 2008–2017) remained below the CAADP 10 percent target (Makombe et al. 2018). By 2018, only 13 member states had met or surpassed their CAADP target of 10 percent public expenditure on agriculture (AGRF 2018). According to the World Bank, average agricultural growth rates across the continent have exceeded 3 percent since 2003—with the exception of 2011 (World Bank 2018).

The Year of Agriculture, Food and Nutrition Security (2014) was a landmark year for African agriculture. It was the 11th year since the Maputo Declaration on Agriculture and Food Security, and the year in which the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods was adopted to realize the continent's agricultural transformation by 2025 (AUC 2014a). No less significantly, 2014 was also the year in which the

Science, Technology and Innovation Strategy for Africa 2024 (AUC 2014b)—accepted by Heads of State and government to replace the 2005 Consolidated Plan of Action (CPA) (AUC and NEPAD 2005)—prioritized food and nutrition security and the eradication of hunger as one of six focus areas. In the international arena, food security and the eradication of poverty remain high-priority areas, confirmed by the announcement of the Sustainable Development Goals (SDGs), particularly Goal 1 (No Poverty) and Goal 2 (Zero Hunger) (UN 2015). In addition, 2015 was the Year of Women's Empowerment—announced by the African Union at its 25th Summit, with a clear call to action for the inclusion of African women in agriculture and agribusiness (AWARD 2015).

The Role of Agricultural Innovation Systems in Driving Transformation

Under auspices of the African Union's Agenda 2063, "The Africa We Want" (AUC 2015), political support for African agricultural development, and the role therein of science, technology, and innovation (STI), has reached an apex (AUC 2015). Full advantage, therefore, must be taken of this concentration of high-level political will, and of the effort and energy within the agriculture and STI sectors, for maximum impact across all levels of society and across the entire agricultural innovation system (AIS), but most especially at the level of smallholder farmer and rural communities.

African solidarity around science may potentially be the most significant strategy for achieving this vision. The current nature and pace of change confronting African agricultural research and development (R&D) are unprecedented in the history of organized research and development. Issues of AIS, R&D, or STI are central to the commitment of African leaders to an agriculture-led social and economic transformation of Africa.[1]

Without question, agriculture and capacity strengthening are now back on the development agenda as Africa positions to achieve the SDGs. The seven Malabo Declaration targets contain two critical targets directly related to agriculture: to eliminate hunger and food insecurity, and to halve poverty through inclusive agricultural growth, with both targets to

[1] In this chapter, AIS, R&D, and STI are used interchangeably to mean, more or less, the same idea of driving scientific and institutional inventions to commercial and social success.

be reached by 2025. The Malabo Declaration targets are ambitious, and achieving them requires a massive leveraging of STI or AIS (AUC 2014a).

Carl Eicher's paper, "The Evolution of Agricultural Education and Training (AET)" was part of the World Bank's study of agricultural education and training in sub-Saharan Africa (Eicher 2006). In its 2007 report on "Cultivating Knowledge and Skills to Grow African Agriculture," the World Bank described an AIS as "a blending of institutional capacities, coordination mechanisms, communication networks, and policy incentives that fosters innovation-led gains in agricultural productivity" (World Bank 2007a, xiv). More recent work refers to the AIS as a "web" (Annor-Frempong and Jones 2014, 67). Science can and should drive transformation of agriculture and society in Africa, as a critical part of this "web."

Poorly integrated agricultural innovation systems are, however, a major drawback for African agriculture. In general, the research, extension, education, and training services are poorly integrated and do not effectively reach farmers and entrepreneurs. The extension system in Africa, particularly, has historically been regarded as the weakest link (Davis 2008).

In June 2014, the African Union (AU) summit in Malabo adopted the Science Agenda for Agriculture in Africa (S3A), as central to implementing the CAADP Results Framework and priorities, outlined in "Sustaining CAADP Momentum" (CAADP 2013). The rationale for the S3A is the imperative of having an overarching strategic framework to guide the broad areas of science that must be developed by African countries, their stakeholders, and partnerships. The S3A focus on the necessary transformation of national science and technology institutions within the AIS in order to achieve the desired social and economic transformation of Africa. The S3A refers to the science, technology, extension, innovations, policy, and social learning that Africa needs to apply to meet its evolving agricultural development goals.

Within the AIS, key stakeholders on issues of STI have developed strong networks and partnership on the S3A, including the African Union Commission (AUC); New Economic Partnership for African Development (NEPAD); the Alliance for Green Revolution in Africa (AGRA); the African Agriculture Technology Foundation (AATF); the African Forum for Agricultural Advisory Services (AFAAS); the main education networks, Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) and the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE); the Pan African Farmers' Organisation (PAFO); and agribusiness networks. At the subregional

level, the stakeholders include the Regional Economic Communities and the subregional agricultural research organizations (SROs). At the national level, the stakeholders include the Ministry of Agriculture and the National Agricultural Research Systems (NARS), comprised of actors engaged in research, extension, education, production, and agribusiness. At the international level, partnerships include the Global Forum for Agricultural Research (GFAR), CGIAR Centers, other advanced agricultural research organizations, and key multilateral organizations, notably the European Commission, the World Bank, and the Food and Agricultural Organization of the United Nations (FAO). These partnerships are integral components for strengthening the AIS in Africa toward transformation.

This revitalization of African agriculture requires an integrated AIS that produces innovations (technical, managerial, organizational, institutional, and service delivery) in a continuous and sustainable manner. Innovation is the key capacity for the generation, acquisition, and application of knowledge for the purposes of economic and social advancement. It includes both the search for technologies at the frontier of science, driven by R&D, as well as forms of learning and adaptation that might be market-led or socially driven. Innovation is highly contextual and path dependent, but it is at the heart of moving the continent from its present mix of resource-driven and efficiency-driven economic activity to one that is propelled by the generation and application of knowledge. Implicit is the distinction between "invention" (solution to a problem, largely the outputs of research) and "innovation" (the economically successful invention). In the context of agricultural research, innovation in its broadest sense covers the activities and processes associated with the generation, dissemination, adaptation, and utilization of technology and knowledge. This also emphasizes the notion that the responsibility of the research organizations does not end with the production of new knowledge or technology. Success can only be claimed when inventions are being disseminated, adapted, adopted, and used (Chema et al. 2003; Anandajayasekeram 2011). Only when knowledge is converted into products and processes and used by society in an economically meaningful way, can it be termed innovative (Carsan et al. 2014).

Research is integral to innovation and must be positioned at the forefront. Closely linked to research are education and training, which serve as key components for building the requisite skills to drive research and innovation. This idea of building more effective agricultural innovation systems has taken root in capacity building efforts for African R&D institutions, especially at the national level.

A Harmonized Roadmap for Agricultural Education and Training Toward a Transformed AIS

In CAADP's 10-year review and subsequent forward planning, Africa's capacity to generate knowledge, foster learning, and enable skills development among its workforce is recognized as a game changer in the context of the rally to fundamentally reshape African agriculture, and thus, food security on the continent (NEPAD 2013). Within this broad context, "Sustaining the CAADP Momentum" called for a roadmap to serve as an overarching continental-level framework, with a realistic and achievable concomitant strategic plan, to effectively address the core problem of human capacity deficit within the AIS (CAADP 2013). This roadmap, known as the Agricultural Education and Skills Improvement Framework (AESIF), serves as a vision and agenda (Swanepoel and Stroebel 2014), intended to both power and empower agricultural technical and vocational education and training (ATVET), as well as tertiary agricultural education (TAE) in the period 2015–2025. The emergence of AESIF was timely and, given the global and regional demographic, political, and economic conditions, its urgency is ever more pronounced.

AESIF is as much an exercise in advocating for *innovative thinking,* as it is a *call for grounding*, *a search for complementarity*, and an *effort at consolidation*. The idea that Africa act in a smart and unified fashion cannot be overstated: AESIF begins by reiterating how intelligent load-sharing and an integrated approach between the different strategic and policy frameworks, implementers, and financing catalysts will undergird its success and impact over the coming decade.

To achieve this harmonization of the continental agenda, NEPAD has been delivering AESIF through the joint work plan of the Tertiary Education for Agriculture Mechanism in Africa (TEAM–Africa) and ATVET, to be in a position to mainstream AESIF in all related NEPAD and continental capacity-building objectives, which align with CAADP and its new Results Framework, moving forward. Contextualized together, the discussions here clearly demonstrate the invaluable role that education and training (at all skill levels) plays in driving agriculture-led social and economic transformation on the continent. Furthermore, this is also confirmed by an analysis of international evidence, as discussed in the next section.

International Evidence to Inform African AET

International evidence confirms the critical role of AET in agricultural development. There is now a wealth of information supporting and advocating the importance of higher education for accelerated development and transformation in Africa (World Bank and UNESCO 2000; AUC 2006; Kellogg et al. 2008; World Bank 2007b). Yet, according to Swanepoel, Stroebel, and Ofir (2014c), though vital to development, AET has been much neglected in agricultural strategies and action plans in many SSA countries.

The situation, however, is improving, reinforced by, among others, the African Ministerial Conference on Higher Education in Africa (CHEA), hosted in November 2010 by the Government of Uganda and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). This seminal meeting "confirmed the African governments' commitment to a 'renewed and vigorous emphasis' on restoring the quality of higher education in agriculture and to increased investment in agricultural education, as part of CAADP Country Compacts and Medium Term Agricultural Productivity Programmes (CAADP 2013)" (Swanepoel et al. 2014c, 11).

AET has been an integral part of national strategies in countries that have developed their agricultural sectors successfully, such as India, Brazil, Malaysia, Chile, and the Philippines (Staatz and Dembélé 2007). These countries have achieved notable successes in establishing productive and financially sustainable AET systems through consistently high levels of investment in AET, both by the countries themselves and by their development partners.

The World Bank (2007a) review identified a set of critical contributing factors for building productive AET systems. These factors include: (1) mobilizing and sustaining political support for AET investments; (2) supporting public investment in capacity building to create the scientific leadership needed to implement the agricultural and rural development strategies; (3) building a system of core AET institutes that make sustained commitments over multiple generations to produce returns; (4) undertaking massive campaigns to develop human capital; (5) establishing closer links between research and higher education institutions and recognizing that the administrative separation of research and higher education in many African countries has inhibited the development of national agricultural innovation systems; and (6) creating incentives to retain the well-qualified and experienced staff in research, extension, and educational institutions. By way of illustration, AET's contributions to agricultural development in selected countries are summarized in Table 5.1.

Table 5.1 International examples of AET contributions to agricultural development

Country	*Key AET investments*	*Results*
Vietnam	In 2001, the government committed to spending 6.9% of GDP on education. Aims to grow participation in the higher education system four times by 2020. Vocational education is a major area for future investment; the aim is to train 40% of workforce (includes extension agents).	Rapid, agriculture-led economic growth and substantial poverty reduction. Tertiary growth: from 120 to 224 institutions in 10 years. Significant tertiary enrollment growth, from 160,000 to 1.5 million in 15 years, with 30% currently in vocational programs.
Malaysia	Massive human capacity-building program; sent thousands of researchers to US universities for postgraduate training.	Developed from a low-income to a middle-income country. Established booming export industry: $6.4 billion palm oil/year.
India	Established state agricultural university (SAU) system (to be built over 40 years). Human capital investment to educate thousands of researchers, with focus on postgraduate education.	Substantial and sustained reductions in rural poverty. Agricultural increases: high adoption rates, with crop yield increase of 1.6% / year for 30 years to 60 million tons grain surplus. Built strong national AET network: 41 SAUs.
Japan	Investment strategy began with explicit focus on building education system first. Invested heavily in developing indigenous education systems focused on smallholder farmers.	Leveraged an agriculture-led development strategy that contributed to its becoming one of the world's wealthiest countries. System of technical colleges with strong links to smallholder farmers.
United States	Supplied permanent funding to build a decentralized, applied, and sophisticated AET system: 60 land grant universities (built over 60 years).	Created one of the most complex but efficient agriculture sectors in the world, including the effective and globally recognized land grant model.

(*continued*)

Table 5.1 (continued)

Country	*Key AET investments*	*Results*
Brazil	Built a cohort of specialized researchers through significantly increasing the number of academic staff with advanced degrees. The national research entity (EMBRAPA spent 20% of its budget from 1974 to 1984 to train Brazilian researchers at masters and doctoral levels. An incentive structure for Brazilian scientists is designed to keep the best scientists at home and thereby prevent the brain drain. EMBRAPA also focused on developing commodities for export.	Moved from a low-income to middle-income country and established a successful export industry (e.g., in the meat and maize markets). Developed one of the most efficient and sophisticated agricultural sectors in the world, recognized for producing adequate amount of affordable food. Has more than 5000 full-time equivalent researchers and its total research expenditure accounts for about half of the total agricultural research spending in Latin America.

Source: Eicher (2006); Staatz and Dembélé (2007); Swanepoel, Stroebel, and Ofir (2014c); Lele et al. (2012)

The analysis of the examples in the table identifies the following strategic points for countries seeking to drive development through agricultural education:

- *Direct investment at country level.* Patterns across Asia and Latin America confirm that AET (and broader agricultural development) require strong country-level institutions.
- *Pro-smallholder farmer (SHF) agricultural development as a national priority.* Without sustained commitment of national governments to continuously improve and invest in the agriculture sector, donor projects are likely to fail. In addition, development literature clearly shows that agricultural growth will not help SHFs in the absence of appropriate policy environments and supportive institutions.
- *Expansion of existing and creation of new programs.* It is important to prioritize postgraduate training to invigorate research and support national agricultural development. This is evidenced by the support of Rockefeller/United States Agency for International Development (USAID, where PhD graduates in agriculture from China have

played a central role in transforming AET development in their country. Recent innovations show the potential of new approaches to rapidly upgrade AET, as illustrated by China's open university system, which serves over one million students per year.

- *Improve quality and ensure alignment with SHFs' needs.* Curricular reform efforts have successfully improved linkages with agribusiness, SHFs, natural resource management, and practical skills, exemplified by, inter alia, Escuela de Agricultura de la Region Tropical Humeda (EARTH) University in Costa Rica.
- *Ensure pro-SHF decision systems.* Agricultural development literature shows that the AET systems most beneficial to SHFs have actively incorporated their needs and aspirations throughout. This is particularly well illustrated by the land grant model in Japan and the success in building the SAU system in India. The Vietnamese agricultural extension system also directly engaged SHFs in the entire process and emphasized the potential role of farmer organizations and local NGOs in developing pro-SHF systems.
- *Improve agricultural innovation systems (AIS).* Development literature indicates that the most effective pro-SHF systems closely link education and training, research, and extension at national and provincial levels. This is also supported by the 2007 World Bank review, as noted earlier, which emphasized the importance of integrated agricultural innovation systems to ensure productivity gains for SHFs (World Bank 2007a). There is some evidence in SSA that land grant-style institutional structures, where AET is closely linked to research and extension, are more successful. Notable examples include the earlier Nigeria land grant initiative, and more recently the Kenyan approach including bold steps to change the organisational structures and the missions the missions of Kenya Agricultural Research Institute (KARI) to become the Kenya Agriculture and Livestock Research Organisation (KALRO) with a broader mandate to make policy, establish research priorities and oversee research centres. The goal is that KALRO's new structure will enable it to administer Kenya's agricultural research and make needed linkages with education and training (ASSAf 2017).
- *Strengthening the funding base.* In Asia, the success achieved through significant investment in agricultural R&D and AET emphasizes the necessity for sustained public funding for AET to achieve impact.

Development partners have been able to leverage strategic follow-up investments across agricultural innovation systems through partnerships and in collaboration with committed national governments.

- *Decentralization of decision-making.* Land grant-style institutional structures have been critical for and highly successful in AET transformation and agricultural development impact in the United States, Japan, and India. The main reason for these successes is that the models in these countries have been demand-driven—and thus, have developed "from scratch."

Challenges and Constraints in the African AET System

As noted earlier, the sub-Saharan AET system has been largely neglected for at least three decades. With some exceptions, it remains inadequately prepared to address the enormous task resulting from the recognition of AET's critical role in development on the continent. Some of the primary challenges are the lack of staff with PhDs, the aging academic workforce, and the limited number of researchers. The most significant challenges facing the system are summarized in Table 5.2.

Recognizing the high levels of political support for African agricultural development, and the role therein of STI, it is a fortuitous time to concentrate efforts and energy in an intentional manner to overcome these challenges.

Toward Transformative Change in African AET

African leaders in business and science are seeking fresh and bold steps that can move agriculture forward toward its full potential on the continent. Political support and resources have been promised, and important coordinating mechanisms for action have been launched (as noted in the introduction to this chapter).

The need for transformative change for success in the AET system is also recognized by strategic initiatives and prominent voices from within and outside Africa (Swanepoel et al. 2014b). This needed transformation can be achieved both through grand plans, as well as incremental change, as long as key levers or potential tipping points are identified, and interventions are structured around such interventions.

Table 5.2 Challenges to the AET system

Misalignment between demographics of graduates and SHF population	Women represent 70–80% of farmers, with limited numbers of women AET students and agricultural workers (e.g., only 10% of extension workforce in Mozambique is female). Students tend to come from urban backgrounds; the few from rural areas are not interested in returning to the rural areas; government and NGOs find it difficult to employ staff (researchers and extension agents) prepared to move or return to rural areas. Employers find it difficult to employ staff who speaks the local languages required to communicate effectively with smallholder farmers.
Misalignment between type of training provided and skills needed in the workforce	Students lack opportunity to develop technical competencies prior to seeking employment and require additional training before taking on their assignments. Employers identify gaps in communication skills, business management and planning, postharvest processing, and marketing. Curriculum and teaching methods include little practical training due to lecturers without appropriate skills, outdated course material, poor facilities (particularly, for research), and a shortage of high quality research projects to engage postgraduate students.
Misalignment between level of training provided and sector needs	Lack of Africa-based postgraduate programs coupled with a reduction in number of scholarships for pursuing training abroad has led to fewer MScs and PhDs. Too few high-level technicians trained for productive work in the agricultural sector. Lack of mobility and articulation within the AET sector, inadequate exit levels into the sector.
AET isolated from research and extension	Administrative separation of agricultural research and higher education into two different ministries has hindered development of an effective innovation system and feedback loop from research to education. AET institutions fail to respond to the need for problem-solvers, facilitators, and practically oriented graduates for extension services. Land grant-style institutional structures have been most beneficial in actively incorporating the needs of SHFs in the agricultural innovation system, e.g., in Japan and India

(*continued*)

Table 5.2 (continued)

Poor feedback mechanisms	Students in AET institutions are rarely directly exposed to SHFs and are engaged primarily in theoretical rather than practical training. Information about labor market needs in agricultural employment is scarce; few AET institutions have tracer studies to understand how their graduates have done in the workplace.
Limited leadership	Immigration has led to an exodus of senior academics (an estimated 30% of all professionals trained in African universities live outside the continent). Overstretched, underpaid lecturers often need to spend more time consulting to augment income than supporting research and postgraduate education. Many academics are nearing retirement age.
Inefficient allocation of scarce resources	AET institutions have proliferated across the continent in Cameroon, five in Ghana). There appear to be opportunities for consolidating some of these investments, and for developing a focus on more cost-effective, integrated approaches.

Source: Vandenbosch (2006); World Bank (2007a); Swanepoel and Stroebel (2012); Swanepoel, Stroebel, and Ofir (2014c)

Many mechanisms have been proposed to achieve this transformation, with various forms of horizontal linkages across the AIS system (see Birner and Spielman (2007) for an in-depth discussion). Capacity-strengthening initiatives (including primary, secondary, vocational, postsecondary and extension education) are at the center of most of these mechanisms, reinforcing the importance of AET within the system. Due to the nature of its strategic position within the larger system, transformative change in AET will, in turn, ripple across the AIS, potentially impacting positively on actors across the value chain—including input suppliers, producers, processors, wholesalers, retailers, and consumers. Potential benefits in the private and public agricultural research systems are also expected as a result of transformative change in AET, as are positive impacts on policy. Together, these changes and ripples contribute to further positive benefits within the broader social, political, technological, and economic systems (Birner and Spielman 2007). In the context of both the status quo of agriculture across Africa and the potential contribution the sector can make to sustainability, development, and in particular, food security, such changes are urgently needed.

As a basis from which to argue for transformative change, it is necessary to understand what is meant by this concept. "Transformative change" is seen as profound, fundamental, and irreversible. It is based on breakthroughs; fundamental shifts in individual, group, institutional, or societal values; and perspectives. Such shifts involve changes in viewpoint, vision, paradigm, life purpose, organizational direction, or sociopolitical reforms, which in turn seed fundamental shifts in behavior or performance. These shifts result in regenerative moments and lead to radical redirections of efforts across a system (Hannum et al. 2007). Transformative change is always more profound in consequence than developmental or episodic change. It tends toward the multidisciplinary and holistic, integrating a range of strategies that focus on peoples' beliefs, values, and attitudes.

Although often unexpected, transformative change can be intentionally planned for or activated. In other words, a system can be transformed over time through a series of incremental changes; transformation may also come about as the result of a shock or strong pressure on the system. The transformation process can be accelerated by understanding what might be "transformative" and by seeking to promote interventions that have a good chance of bringing about fundamental change (Ofir, Swanepoel, and Stroebel 2014).

In seeking to activate transformative change, it is necessary to consider the balance between drivers or enablers (catalysts of change) of existing strengths in the AET system, and drivers of vulnerabilities and constraints that act as impediments to change (Fig. 5.1). Significant or transformative change may come about if the combined effect of the positive influences is more powerful and effective than the vulnerabilities and constraints in the system. If change is to happen, these two types of forces on and within the system should not be in equilibrium. Just a few strategic interventions over time may overcome the constraining forces. This is why it is important to try to recognize which interventions might be transformative for the whole system.

An understanding of what could shift the balance in critical parts of the AET system will help determine the strategies needed to bring about the desired transformative change. The challenge is to identify those factors and interventions likely to be most pivotal for this purpose and those that might be poised to result in tipping points leading to transformation. The interventions have to be combined and sequenced well for best effect and to prevent disequilibrium. If the process is not properly managed, the whole system might become ineffective or even disintegrate.

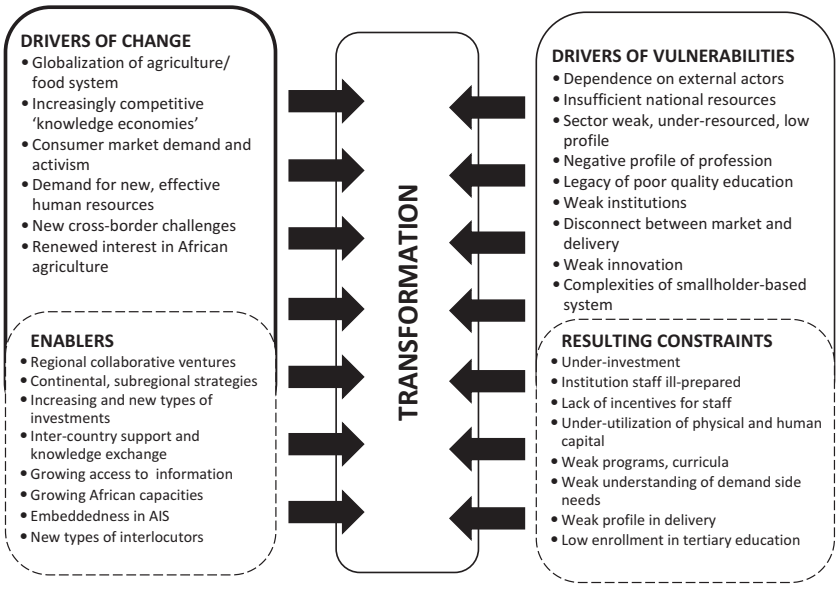

Fig. 5.1 Critical forces and influences that affect the potential for transformation in the AET system. (Source: Authors' construction based on Swanepoel, Ofir, and Stroebel (2014a, Fig. 17.2, 466))

In addition, leaders should be in a position to predict, at least to some extent, the intended and unintended effects of planned interventions—both positive and negative—and ensure that capacities are in place to make fast adjustments as needed. Trajectories toward transformation are hardly predictable, but informed leaders in each institution or set of institutions, country, and subregion can establish, at the very least, enabling conditions to improve the chances of success and develop an AET strategy, which emphasizes those interventions likely to make the most effective and sustainable changes.

Context most certainly plays an important role in this process. There is thus a need for "best-fit" solutions, that is, tailor-made for a specific set of circumstances and able to evolve as the context evolves. Thus, the actual design and implementation need to be managed by leaders at all levels of the system—leaders who truly understand the context within which the changes are to take place and who are committed to working toward success over time—and where necessary, in collaboration with one another.

Experiences in China have shown, for example, that significant progress toward transformation in agriculture can be achieved through a series of purposeful, yet incremental steps, taken with consistency of purpose and investment in traditional systems (Xiaoyun et al. 2016). The Chinese experience showed that putting smallholder farmers' needs at the center of policies and plans is crucial, and that smallholder and large-scale agriculture can exist side by side with mutual benefit. The Chinese developed context-based strategies and facilitated transformation toward a market system by ensuring that critical inputs and services could be accessed in an economical manner. They also enabled gradual market reform to protect smallholders from a "market trap."

Many lessons can be drawn from country examples with regard to achieving transformative change—but should be contextualized in an African framework to ensure relevance and promote ownership of Africa-driven solutions for African problems.

Roadmap Toward Transformative Change in National AET Systems

Despite the contextual diversity, there are many common drivers of vulnerabilities and drivers for change, as well as enabling and constraining factors in the African AIS. With this commonality in mind, it is possible to start constructing an "ideal" roadmap that can serve as a broad indication of which routes might lead to change (Fig. 5.2). The creation of this roadmap has been informed by Eicher (2006); Pal and Byerlee (2006); Stroebel, Swanepoel, and Eicher (2011); and Swanepoel, Stroebel, and Ofir (2014c).

The proposed roadmap is not intended as a blueprint. It is general by design, intended to be part of a process of rethinking, reframing, and reshaping structures and ideas toward the goal of radical transformation of the AET system within the framework established by the AIS. In particular, it emphasizes the interests, concerns, and needs of smallholder farmers.

Emerging from this ideal roadmap, four critical areas for investigation and investment emerge (Fig. 5.3), namely: preconditions and a supportive environment, relevant institutions and adequate resources, appropriately trained graduates, and strong effective partnerships and networks for impact as indicated in Fig. 5.3. Areas in need of future attention are proposed in the framework and discussed next based on the gaps identified in this ideal system.

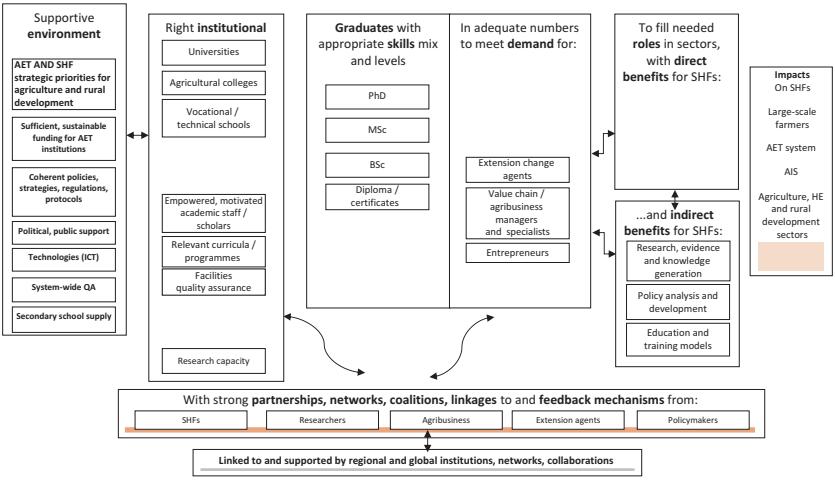

Fig. 5.2 Ideal AET system. (Source: Authors' construction based on Swanepoel, Ofir, and Stroebel (2014a, Fig. 17.6, 474))

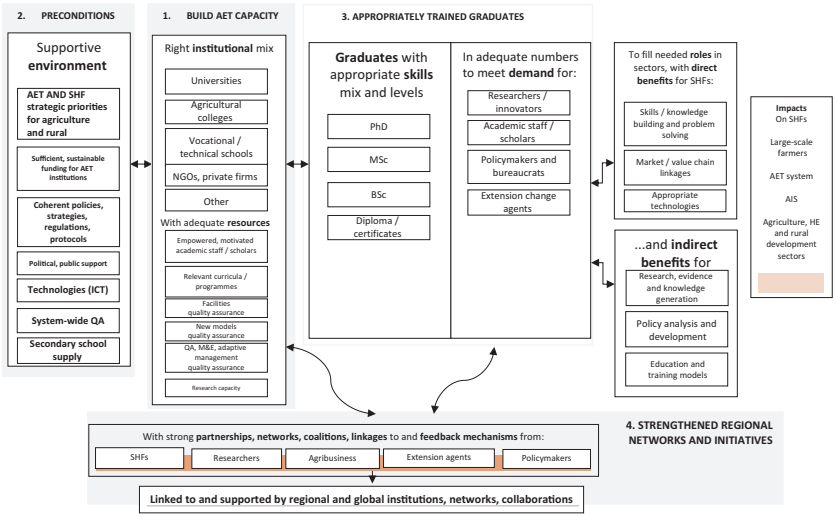

Fig. 5.3 AET system: critical areas for investment. (Source: Authors' construction based on Fig. 5.2)

Preconditions for Success: The Supportive Environment

The characteristics and quality of the external environment determine the level and type of support and resources available to the individuals, institutions, collaborations, and networks in the system as well as the ease with which their work can be done. For this reason, an enabling environment is considered a precondition for success, in the absence of which AET cannot function optimally within the AIS. Attention should therefore be given to the economic, political, policy, sociocultural, environmental, demographic, and technological conditions that affect institutions and their interrelationships positively and that—when synergistically interlinked—create the optimal conditions for AET to function.

Governments have a particularly important role to play in establishing and sustaining enabling environments. Particular examples of countries successful in establishing a supporting environment include the United States, Brazil, India, and Ghana. Government policies, strategies, regulations, and protocols play a highly instrumental role in transformative change given the proliferation of actors, linkages, and markets in the agricultural innovation system. In order to establish a truly enabling environment for AET, policy and strategy on the continent must pay attention to a number of key issues, including: the real needs of smallholder farmers, gender-responsiveness, entrepreneurship and intellectual property protection, the alignment of national incentives and policies to encourage systems-based approaches and multi- and interdisciplinary research, and integration between the higher-education sector, industry/community, and government. Examples of countries particularly successful in integrating the different role-players in the agricultural innovation system include the United States and The Netherlands. The United States created a highly complex but efficient agricultural sector based on the globally recognized land grant model. The Netherlands created Wageningen University and Research Centre through a similar approach by successfully integrating agricultural research and agricultural education, as well as by training role-players. Governments also have the responsibility to create an environment that promotes positive outcomes while guarding and protecting the agricultural sector—in particular the smallholder farmer—against any action that might negatively affect national, sector, or AET system interests. Institutions across the AET system are well positioned to help identify and alert governments to such opportunities and risks and should nurture relationships that will help ensure that expert opinions are sought and heard.

Build AET Capacity: Relevant Institutions and Adequate Resources

Capacity building in Africa, especially in the higher-education sector, was a low priority for donors and governments alike for a long time. This situation has been changing since 2008 (World Bank 2007b); yet it will take exceptional leadership—carefully selected, innovative strategies, and new energy and commitment to ensure that the institutions in the AET system undergo the type of transformative change that has been described in this chapter thus far.

There is extensive literature documenting the challenges facing AET institutions in Africa, including *Towards Impact and Resilience: Transformative Change in and through Agricultural Education and Training in Sub-Saharan Africa* (Swanepoel et al. 2014a). Among these challenges, three issues stand out: resource constraints (that is, lack of funding to provide high quality education), capacity constraints (at institutional and individual levels), and a lack of relevance of AET activities to broader systems and smallholder farmers. Within an enabling environment, it is critical to address these resource and capacity concerns in order to improve the relevance of AET to the AIS.

Appropriately Trained Graduates

Increasingly, new trends and paradigms are likely to influence the sector in coming decades, and the result is that there will be greater demands for better and new types of graduates within the system. These graduates have to be entrepreneurs outside and across international and local value chains; able to work effectively in systems with and as researchers, extension agents, and farmers; and adaptive enough to evolve with new demands and opportunities. Institutions therefore have a series of issues to deal with as part of the transformation of the AET system.

All levels of education and training across the spectrum—vocational, college diploma, undergraduate, and postgraduate education and training—are critical and should work in a synergistic manner. The success of this approach is beginning to emerge in the Ethiopian system, where there is national coordination between various levels of AET training (that is, ATVET and the university system). In addition, it remains important to prioritize graduate education and training to invigorate research and to support national agricultural development. Numerous initiatives across

the continent have echoed the importance of this prioritization, and initial outcomes are encouraging. By way of illustration, as an outflow of their broader activities on the continent, in 2014, the Carnegie Corporation of New York sponsored a workshop focused on the escalation of the production of PhDs in the agricultural and life sciences, held as a side event to the biennial Regional Universities Forum for Capacity Building in Africa (RUFORUM) in Mozambique. The workshop sought to identify critical enhancement opportunities and to consider possibilities for expanding strategically selected partnerships and alliances in the region. A further example is a consensus study commissioned by the Academy of Sciences of South Africa (ASSAf) to identify the challenges facing the agricultural education and training sector (AET) in South Africa. The outcome of the consensus study was a high impact report that provides evidenced-based information and clear recommendations to relevant stakeholders with an interest in an agricultural human capital development and a knowledge system that drives smallholder, farmer-led development initiatives and innovation in order to achieve commercial food production and increased productivity, food security, as well as economic growth and development (ASSAf 2017).

Partnerships between the secondary school and higher education sectors can serve as a medium to improve the quality of students entering into TAE and can stimulate youth interest in agriculture as a career.

Ideally, if resources allow, new and innovative models of formal educational delivery should be considered, such as EARTH University. It is particularly enlightened in its inspirational, yet unapologetic, focus on developing leaders for the AET system and agriculture sector. Other innovative examples include Japan's Education for Sustainable Development of Africa (ESDA), which is an initiative involving eight universities in five African countries with a three-pronged master's program, which is helping to build the next generation of researchers and leaders skilled in sustainable development. The courses are delivered in a manner that takes postgraduate students directly into the field to address practical issues that relate to sustainable development concerns in communities that they are familiar with and understand. A further example, Wageningen University and Research (WUR) has staff and students from over 100 countries. These individuals work primarily in the discipline of healthy food and living environment for governments and the business communities-at-large. WUR combines specialized research from research institutes with the university environment and places value on the combined efforts of the vari-

ous fields of natural and social sciences. This union of expertise leads to scientific breakthroughs, which can quickly be put into practice and be incorporated into education.

Furthermore, new mechanisms to access and share information and learning, facilitated by information and communication technologies and social media, are widely recognized as having significant potential to leapfrog poor infrastructure and enable better scholarship. Advanced information and communication technology facilities can promote collaboration, for example, by sharing expert scholars among institutions and drawing upon non-university experts from various spheres—government ministries, NGOs, national agricultural research organizations, CGIAR, the private sector, and think tanks—to bring their knowledge into the higher education domain.

AET in sub-Saharan Africa must also increase its understanding of African farmers' learning strategies, approaches, and methods. Farmer study groups and learning circles are examples of valuable learning approaches that allow for farmer-centered learning.

Systemwide quality assurance and learning are needed, made possible through appropriate and useful external and internal monitoring and evaluation, supported by an effective accreditation system. These elements are regarded as crucial for the regulation of the system, including ensuring the relevance of the curricula. Importantly, quality assurance and learning provide information for strategic and operational decision-making at various levels within the system, and among those to which the various institutions in the system are accountable.

Strengthened Regional Networks and Initiatives

The success of the AET system requires the coordinated activities of a range of organizations. The role of networks is to reinforce and concentrate on problems that require collective action and to pool talent to reach the critical mass and synergy necessary for realizing creative solutions. These networks are becoming an increasingly popular way of building a strong human capital development infrastructure and harnessing gains from innovation in the research process. Moock (2011) characterized successful professional networks as having the ability to retain researchers in Africa, keep them scientifically active, and encourage and motivate them to make measurable contributions to the broader system of innovation in the agriculture sector. How these networks function, and the nature of

formal and informal interactions within them, are important aspects of the AET system's organizational performance.

AET networks span both public and private sectors and include postgraduate training and collaborations that strengthen institutions. Unimpeded by geography, such a collection of agricultural scientists can capitalize on greatly improved mobility and telecommunications to transcend institutional and national boundaries. Of particular importance is that these networks have the "ability to produce 'scientist entrepreneurs,' create professional career structures, ensure gender equity, build economies of scale and serve as leverage points for translating knowledge into innovation and application" (Moock 2011, iv; Sachs and Alston 2010).

A number of such agricultural networks now exist on the continent—both for academic training and for broader capacity development. The African Women in Agricultural Research and Development (AWARD 2015) initiative is an outstanding example of collaborative efforts to address capacity development, particularly among women in Africa. AWARD partners with more than 300 organizations and institutions, including many national institutes of agricultural research, to offer AWARD fellows a two-year career development program focused on fostering mentoring partnerships, building science skills, and developing leadership capacity. Between 2008 and 2018, 465 African women scientists from 16 countries (including Benin, Burundi, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Togo, Uganda, and Zambia) have benefited directly as AWARD Fellows (AWARD 2015). Since 2019 AWARD One Planet fellowships are now offered to either men or women working on climate change issues related to agriculture. Over its duration the One Planet fellowship will invest in 630 African and European agricultural scientists by building a vibrant, highly connected, and intergenerational network of African and European scientists leading climate change research.

Notable networks for academic training are RUFORUM, the Collaborative Masters of Agricultural and Applied Economics (CMAAE), Education for African Crop Improvement (EACI), Biosciences Eastern and Central Africa (BECA), and the Program for Emerging Agricultural Research Leaders (PEARL).

Moock (2011) highlighted a number of challenges that need to be considered when setting up and promoting networks. Despite an array of strong agriculture postgraduate and research networks, the networking

concept is still evolving. All too often, for a variety of reasons (which are listed here), emerging networks fall short of meeting their promise to advance higher learning and ultimately agricultural performance. First, the number of qualified universities for advanced training and participation in research networks is still limited, with many unable to meet fundamental standards for teaching and research and, hence, for accreditation or global recognition of degrees. Second, rushed planning under heavy pressure from potential funders can result in poor design and impeded implementation. Third, attempts to build alliances between universities and larger agricultural innovation systems can lead to frustration if they fail to create added value for all members. Fourth, many networks never reach the take-off point, because they do not use their assets strategically to produce significant public goods. Finally, collaborative arrangements may easily break down if partners do not reach early agreement on common interests, expectations, and contributions. Such prior negotiations offer high organizational payoff, especially in the event of tight fiscal conditions.

This type of analytic approach should inform the inception and design of networks to promote success and avoid pitfalls. For optimal impact, these networks need to concentrate on problems requiring collective action and need to pool their talents to reach critical mass and synergy and realize creative solutions. If well designed and implemented, these types of networks are critical mechanisms for building the next generation of innovation-minded agricultural scientists in Africa (van Rooyen et al. 2001; Posthumus et al. 2013). The networks are major vehicles for launching and maintaining scientific careers, and their unique nature positions them as potential game changers.

Various global networks and partnerships can also be harnessed to enable the escalation of impact within the African agricultural sector. One example is the Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GCHERA), of which the South African Agricultural and Life Sciences Deans Association (SAALSDA) is a member (GCHERA 2019). The consortium aims to include and serve institutions with programs in agriculture, veterinary medicine, and natural resources management, including the biological, physical, and social sciences dimensions of these fields. GCHERA is intentionally designed to be of help to systems of higher agricultural education seeking significant reform, and thus, could be of particular value to AET in Africa.

Impact on the AET System: Toward Resilience

The AET system in sub-Saharan Africa needs to be transformed, with a specific focus on the interests of the smallholder farmer. Taking into consideration the role of the smallholder farmer in Africa, positive transformation in AET will, in turn, have positive impact on these farmers, their communities, and ultimately, on social and economic development on the continent, as well as the resilience of individuals and communities. These are—in theory—the expected long-term expected outcomes sought through transformation of the AET system.

The foreseen transformation will have a major impact on the AET system (see, also, Swanepoel et al. 2014c). If well designed and implemented, the transformation will lead to a more effective, efficient, relevant, and respected continental AET system, with the "ideal" attributes described in the proposed roadmap. However, the scope of and balance between the desired attributes of the system will differ from country to country, depending on the vision, initial situation, and possible strategies.

In the long term, the envisaged transformation should also lead to a more resilient system. In simplest terms, the resilience of a country, society, system, or institution depends upon its ability to be flexible and to adapt readily and effectively to slow or rapid change—or to resist such change if this will lead to better results in the long run. Similarly, the resilience of individuals and the groups to which they belong is determined to a great degree by their ability to adapt quickly and effectively or to resist shocks or evolution in the environment. Strategies and interventions should, therefore, not only transform the AET system to be more relevant, efficient, and effective in its value addition to the AIS, but also make it more respected and in the long term, more resilient.

The starting point for cultivating resilience is to identify the drivers for current vulnerabilities. A concerted effort across the continent is needed to build resilience by working to eliminate drivers of vulnerabilities and the accompanying constraints to cultivating resilience. This places responsibility on each subregion or country working on AET strategies to attend to the issue of resilience to the best of its abilities. This will be essential if Africa is to sustain itself and flourish in today's highly competitive global context—in particular, in a system that is at the core of Africa's increasingly important, yet still weak, knowledge economy.

AET is part of the AIS and interlinked with many other open systems. Its successful transformation will therefore have impacts far beyond the

system itself—on agriculture value chains, on rural development, and in the higher education sector. Eventually, transformations in AET will impact society itself.

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CHAPTER 6

Science as a Development Tool in Ghana: Challenges, Outcomes, and Possibilities for Women Academic Scientists

Josephine Beoku-Betts

Introduction

As African societies struggle to claim equal roles as partners in the global market of the twenty-first century, questions are raised in regard to the attributes they bring, such as innovation, an indigenous basis of knowledge, and the ability to effectively harness human resources to promote the development of more sustainable scientific and technological systems. A country's ability to develop scientific knowledge into wealth and social good is a significant indicator of its future prospects and ability to effectively compete in the global market (Mashelkar 2002, 188). At present, the state of science and technology in Africa cannot meet these challenges, although progress has been made in increasing the gross domestic product (GDP) per capita in the majority of African countries and in public investment in science and technology, as part of poverty reduction strategies.

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The level of investment in science and technology research and development for the Africa region remains significantly low by world standards. For example, in 2010, research and development expenditures for Ghana were 0.3 percent of GDP (UNCTAD 2011). The exception is South Africa; at 0.93 percent, it is the only country close to reaching the 1.0 percent target set by the African Union (UNESCO 2010).

Since 2006, some countries (for example, Cameroon) have endeavored to invest in science and technology research and development (R&D) by raising salaries of academics. Others, like Mozambique, Rwanda, and South Africa, have established ministries of science and technology, while Nigeria, Ghana, and Botswana have created national science and technology development plans. The African Union also created and adopted Africa's Science and Technology Consolidated Plan of Action (2008–2013), which is designed to channel more funds into science and technology on the continent. So far, progress has been made to advance biosciences and water research and to produce the first set of pan-African R&D statistics (UNESCO 2010). With funding from the Bill and Melinda Gates Foundation, the African Scientific Development Academy was also launched in 2004, to enable African scientific institutions to develop and implement mechanisms for evidence-based advice to national governments for strategic planning (UNESCO 2010).

Universities provide an important institutional medium for the effective development of science and technology, through teaching, research, and learning initiatives that will build new capabilities. Given the political willingness and support of their governments, it is their role to hold "the state and business sector accountable while potentially providing a source of debate on current directions and visions of society's future" (Sall et al. 2003, 128). In the transition period after independence, African universities advanced this goal in developing human resource capacity. However, various crises, such as civil wars, military coups, famines, health epidemics, poverty, and neoliberal economic reform programs, have undermined the universities' capabilities to effectively harness the intellectual capacity of faculty and students in recent decades. The increasing reliance of African universities on international donor agencies and research foundations for support—while very important—has also meant that they cannot steer research in directions they define, such as the effective utilization of indigenous scientific knowledge in the development agendas of their societies.

The training and employment of women and girls constitute an essential component of the resources and new capabilities needed for sustain-

able and equitable development of science and technology in Africa. Moja (2004) argued that there is a tendency to marginalize these issues in discourses on globalization and higher education in Africa, as well as on new development initiatives. Because girls are disproportionately underrepresented at every level beyond primary school, this holds adverse implications for the participation and advancement of African women in science and technology development. For example, Manuh, Gariba, and Budu (2007, 31) stated that only 2.6 percent of Ghanaian pupils who enroll in primary school will eventually qualify to enter universities. At the university level, available statistics indicate that women constitute 38.0 percent of total enrollment in bachelor-level degree programs, 25.0 percent in doctoral-level degree programs, and 18.0 percent in scientific research careers in Ghana (UNESCO 2010). In view of these disparities, the general consensus is that even though various United Nations conferences and world summits have recognized and called for support from governments, educational institutions, scientific communities, civil society organizations, and the private sector to develop the capacity and full participation of women and girls in science and technology, failure to provide disaggregated data by gender on science and technology education and employment, gender inequalities in work-life balance and decision-making positions, gender pay gaps, and persistent masculinist scientific environments prohibit many women from advancing educationally and professionally in science and technology fields (UN 2010).

This chapter examines how women scientists in university employment in Ghana are situated in the development of science as a policy objective for higher education. It focuses on how political and economic conditions over the past two decades and a patriarchal cultural environment impact women's ability to effectively contribute to the scientific and technological development agenda in their society. It addresses how they navigate these conditions, shape their own understandings, and situate a shared membership through community engagement. The study is based on semi-structured interviews of a small sample of 12 doctoral-level women scientists in three public universities. Issues addressed are: (1) how political and economic conditions, including patriarchal institutional environments within universities, affect the ability of women to practice science as teachers and researchers; (2) challenges that women academic scientists face in the scientific profession; and (3) perspectives that women academic scientists bring to framing the role of science in the development of Ghana.

I address these concerns by first examining feminist perspectives on the impact of globalization on the academic profession, followed by a discussion of the research context of the study, and finally, analysis of the data and conclusions.

Globalization and Women in Academic Professions

Since the 1980s, profound economic, technological, and social changes brought about by globalization have raised awareness of possibilities for new markets, new information and communication technologies, flexible labor markets, and population mobility (Blackmore 2000). Globalization has imposed a process that calls for internal and external competition among nation states, industries, and transnational corporations. It assumes that competition generates creativity and innovation, and that those who succeed will be rewarded with more resources (Stromquist 2007, 3).

Globalization has adversely affected most countries in Africa in terms of declining commodity prices and increasing prices of imported goods. In order to cover public expenditures, many countries have increased their borrowing from international financial institutions, thus leading to an escalating debt crisis and various austerity programs, with adverse consequences. For example, most higher educational institutions that rely primarily on state resources for their operating budgets have suffered from declining funding from the state. Subsequent problems include declining investment per student at all levels, long-term deterioration of infrastructures—from buildings to libraries and laboratories, larger class sizes, severe overcrowding of classrooms, erosion in the quality and level of student achievement, inefficiency in the management of university systems, an increasing loss of faculty to other countries, and a marginalized research status in the global scientific community. Africa now has the weakest higher education system in the world (Teferra and Altbach 2004).

Privatization, or what some describe as "the new managerialism," with its "constant preoccupation with finance, measurement, marketing and accountability," has become a primary solution for addressing the economic crisis facing African universities (Morley 1999, 189). There is now an increasing urgency among universities to compete with other universities and to establish partnerships with industry and business. Within universities, this competition has led to hierarchies among departments and faculty. Faculty with funded research are rewarded more than those who generate less funding or focus more on teaching. The curriculum is increas-

ingly being designed in fields that are vocationally marketable and that will not cost much money in facilities, equipment, and technology. There are also increased budgetary controls, increasing demands for accountability, and less competitive salary structures (Stromquist et al. 2007).

One area of tension in the drive for "the new managerialism" in higher education is its impact on the work experiences of women academics. Acker and Armenti (2004) pointed out that discourses on how globalization has impacted higher education and the academic profession have been largely degendered, in the sense that problems affecting the academic profession are viewed as a consequence of trends that transcend social inequalities, such as gender and race. Blackmore (2000, 334) argued that while the language associated with globalization and education reform may appear to be gender neutral, policies associated with this process have radically altered gender relations by "changing the very nature of the state and its relation to the individual, household, and community." A work environment that emphasizes performance and competition benefits men more than women, who are more often in vulnerable disciplines and lower academic ranks. It is women who also take on the care responsibilities in the home and workplace when the state withdraws public services. It is women academics concentrated in the lower academic ranks who teach more, spend more time mentoring students, and have fewer research funding opportunities, because they are often excluded from "old boy" networks. According to Fay Gale (cited in Currie et al. 2002, 39), "There is an expectation in universities that unlimited time will be devoted to academic work, and as women often have significant domestic responsibilities, they find it difficult, if not impossible, to meet this unrealistic expectation." As a result of these trends, academic women continue to be underrepresented at the upper levels of the academic profession.

Although women academics face many constraints and barriers in universities, increasingly driven by the market principle and a persistent patriarchal power structure, some opportunities do exist for women to exercise their agency on multiple fronts. In some countries, women's movements are appealing to the global women's movement and the United Nations to hold their governments accountable for discriminatory practices affecting gender equity. Feminist academics are demanding transparency from their universities in institutional practices, particularly in high-ranking administrative appointments. Some women academics are using their research to inform education, social, and economic policy, while others have restructured their research and teaching agendas in more entrepreneurial ways (Currie et al. 2002; Blackmore 2000). This chapter builds on these

feminist approaches by examining how women academic scientists are situated in the development of science and technology as a policy objective for higher education in Ghana, the perspectives they bring to framing this process, challenges they face, and how they have taken advantage and navigated new possibilities and styles of management to promote their own agendas.

Research Setting

Ghana is a West African country with a population of 28.8 million (UNDP 2018) and a gender ratio of 50.147 percent female and 49.853 percent male in 2018 (World Bank data).[1] It was the first sub-Saharan African country to gain independence from Britain in 1957, and it is an ethnolinguistically diverse society, with about 44 indigenous languages. English is the official language of communication and medium of instruction.

In spite of the numerous development problems it shares with other African countries, Ghana can be characterized as a dependent and relatively stable developing economy. It has progressed to the status of "medium human development" country. Ghana's human development value for 2017 as reported in the UNDP Human Development Indices and Indicators: 2018 Statistical Update is 0.592, a 30.1 percent increase from 1990 to 2017. This is above the average of 0.537 for countries in the sub-Saharan Africa region. Life expectancy is 63.0 years. Expected years of schooling is 11.6 and the percentage of the population with at least secondary school education is 54.6 percent for females and 70.4 percent for males. The 2017 UN Human Development Index ranked Ghana's Gender Inequality Index value at 0.538, ranking 131 out of 160 countries, indicating wide gender disparities (see UNDP's statistics).[2] The economy has remained dependent on external financial assistance, generated limited employment, and maintained an external debt of US$ 17 billion in 2014.[3] Ghana's per capita income is $1684, and its poverty rate is 28.6 percent. Despite these low figures, which indicate wide economic disparities, significant progress has been made on poverty reduction. It was the first

[1] https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS?locations=GH

[2] http://hdr.undp.org/sites/default/files/Country-Profiles/GHA.pdf

[3] https://www.cia.gov/library/publications/resources/the-world-factbook/geos/gh.html

country in sub-Saharan Africa to achieve the Millennium Development Goal 1, which aimed to reduce extreme poverty by half.[4]

Ghana has a commitment to the development of science and technology, as part of its goal to accelerate economic growth. In 2010, the National Science, Technology and Innovation (STI) Policy was revised, with emphasis on Ghana's becoming "a middle-income country, based on STI application, adoption and development" (UNCTAD 2011, 30). STI's underlying objective is to increase wealth creation, poverty reduction, sustainable environmental management, and industrial growth. Ghana also has a strong tradition of indigenous science and technology in areas like healthcare and agriculture, and the government is committed to developing alternative options for healthcare, such as the development of plant-based medicines (UNDP 2000).

To attain these goals, the government has established several science and technology centers and a network of 13 research institutions under the Council for Scientific and Industrial Research (CSIR). These institutions and science departments in the universities are mandated to promote science and technology research and to promote science and technology "through awareness creation, research, diffusion, and commercialization (UNDP 2000, 6). In spite of these efforts, the level of investment is low, and as already mentioned, only 0.3 percent of the country's revenue is allocated to science and technology (UNCTAD 2011, 27).

While gender inequality continues to limit women's capacity to participate in the development of the country, Ghana has a strong tradition of women in matrilineal kinship systems, women in the formal and informal sectors of the economy, and women-led NGOs. For example, the women's movement was instrumental in the passing of the Domestic Violence Act in Parliament. The Association of Women Scientists in Ghana is an active member in the national scientific community. This group published a directory in 1995, to highlight the range of scientific disciplines women are engaged in and that could be used in a consultative capacity for national development. Women scientists in Ghana are also involved in the development of science clinics for girls, an initiative that is now being adopted also in other African countries.

[4] http://www.gh.undp.org/content/ghana/en/home/countryinfo/

African Women Scientists in the Academy

Although the trend toward knowledge production in a market-driven economy favors science and technology, women scientists in Ghana face struggles for legitimacy in the patriarchal institutional environments they work in, as well as being adversely affected by the marginalized position of their country in the global economy. As Subrahmanyan (1998, 41) described it, "these women are marginal Third World Scientists." In the 1990s, women academic faculty comprised only 13 percent of academic faculty in Ghana's three established public universities and, compared to their male counterparts, were less likely to hold terminal degrees. At Cape Coast University, only one woman held the position of professor, and at the University of Ghana, a woman was elected pro-vice chancellor in 1996 (Manuh et al. 2007). Currently, Kwame Nkrumah University of Science and Technology and the University of Ghana have a significantly higher percentage of men at all academic ranks, compared to women, and the higher the academic rank, the fewer women are represented. Because opportunities to serve on university boards and committees are determined by the position held in one's department, fewer women are represented in university decision-making structures, such as the position of dean (Manuh et al. 2007).

The male patriarchal culture of African universities has been seriously critiqued by several African feminist scholars. They have argued that this climate has created an unfriendly and chilly academic environment for women students, staff, and faculty and needs to be addressed in policy reforms of African higher educational institutions (for example, Kwesiga [2002]; Manuh [2002]; Mama [2003]; Manuh, Gariba, and Budu [2007]; Pereira [2007]). Manuh (2002) noted, for example, that "the academic environment is governed by patriarchal values and beliefs and that female lecturers and students are generally considered less knowledgeable than their male colleagues, but also have to work twice as much to legitimate their positions and authority" (Manuh 2002, 45.) Women are also subject to sexual harassment and exclusion from "old boy" networks and opportunities for career advancement, such as grants, scholarships, and fellowships (Imam and Mama 1994; Prah 2002; Manuh 2002). All these factors create a gender imbalance in terms of the allocation of resources for training. It also puts women at a disadvantage in terms of meeting their own expectations to pursue their studies and scientific careers. Efforts are now being made by African feminist scholars to address these gender imbalances

by undertaking more gendered analysis of their institutional environments and integrating issues of identity, sexuality, and culture into research and curriculum development practices (Manuh et al. 2007).

Finally, the gendered division of labor in the domestic sphere is crucial for understanding how women scientists navigate work–life balance to achieve career advancement in scientific disciplines. In a study of Ghanaian women in the academy, many stated that they did not experience discrimination in their institutional environment, but they felt disadvantaged in terms of career advancement because of their domestic responsibilities (Lamptey 1992, cited in Morley 2005, 214). Although there are many examples of women scientists who balance work and family effectively, it usually requires strong organizational skills and support from family members or hiring of domestic workers. As Mama (2003, 119) has aptly stated, "In the absence of maternity, child-care, and domestic support provisions and/or a change in gender relations and sexual cultures to allow men to share in both the pleasures and the burdens of time-consuming domestic and parenting responsibilities, women will continue to find it difficult to meet the increasingly complex and competitive demands of academic careers."

Research Study and Method

This study is drawn from a larger study that I conducted on the perspectives and experiences of African women in academic careers. I draw on a small sample of 12 doctoral-level women scientists employed in research and academic institutions in Ghana and who studied for their PhDs in European and North American universities. The criteria for selecting this particular group were that the women must have attained their undergraduate degrees in scientific disciplines in their home countries, they obtained graduate degrees in their home countries or elsewhere, and they have teaching or research work experience in their own country. Interviews were conducted with women from the University of Ghana, Kwame Nkrumah University of Science and Technology, and University of Cape Coast. The sample represents a variety of scientific disciplines, such as applied human nutrition, biochemistry, pediatric nutrition, food science, physics, food enzymology, plant physiology, entomology, horticulture, zoology, and pharmacology. Study participants also represent different levels of seniority: 1 professor, 2 associate professors, 5 senior lecturers, and 4 lecturers or research fellows (US equivalent of assistant professor).

They ranged in age from 37 to 67 years. All of the women were married with the exceptions of one single participant and one who was divorced. With the exception of the study participant who was single, all of the remaining participants had children. Many of them were also responsible for raising the children of less privileged, extended family members.

I found study participants through my own participation at conferences on women in science, as well as through key individuals. As a result of these contacts, I was able to gain access to women scientists through snowballing techniques and by earning the trust and confidence of those who were willing to be interviewed. As an African scientific researcher, I was able to gain their trust and participation by explaining my interest in bringing the voices of African women to the discourse on recruiting and retaining women in scientific disciplines and careers.

Data collection applied standard qualitative research methods: semi-structured interviews, open-ended interviews, and direct observations. Semi-structured interviews were designed to give the participants the opportunity to voice their opinions and experiences in their own terms. Although the interviews followed guidelines, they allowed ample opportunity for the study participants to elaborate or to introduce issues considered relevant. Each interview was completed in 1.5 to 2 hours, although in some cases, subsequent interviews were necessary. Interviews were conducted in person, or by telephone. All the interviews were tape recorded with the exception of one person who refused to be taped. I took notes openly during the interviews and kept a journal of my observations and conversations with each study participant during and after the interview. After transcribing the taped data, I searched for general themes repeated in the interviews and sorted them for relevance and order of importance. I looked for detailed, perhaps even mundane responses, and the meanings attached to these sets of information. All the names of study participants are pseudonyms.

Perspectives on the Role of Science and Technology

In societies in the global South, participation in the production of scientific knowledge involves research practice and engagement in wider public debates about ways in which this knowledge can contribute to nation building, particularly in areas of poverty reduction. All the women scientists in this study had a clear understanding that scientific practice should have a broader social purpose designed to foster social change and

development in their society, although there were some different points of emphasis. The most frequent explanation of the role of science was that it should benefit the people. For example:

> Science and technology to me is the bedrock for any national development. In Ghana, there are a lot of scientists doing relevant research, but most of the nation does not see the benefit. There is a gap between research and the end product. I would like to see a situation where government could create a clearinghouse where ordinary research in the area of science and technology could be brought together, and we can see what areas can be used for development. (Dr. Bisi Leona, Lecturer, Zoology)
>
> Science should be made very relevant to the people. It's one reason why I got involved in things that are not directly related to my job. It's only when you get close to people that you can think things with them and apply science. We need to bridge the gap between the ivory tower and the ordinary person in the street. It should permeate people's lives, especially in rural areas. (Dr. Fatu Dena, Senior Lecturer, Pharmacy)

In each of these narratives there is concern that there is a gap between the research and those it is expected to benefit, because the research is not always based on the felt needs of the people. There is a sense—though not explicitly stated—that Ghanaian researchers do not have the luxury of practicing science for the sake of science, but that it should be directly related to societal needs.

Study participants also put a lot of emphasis on the need to place more value on indigenous scientific knowledge and to integrate these practices into the development of science for commercial purposes. They are aware that the indigenous scientific knowledge in their societies is a valuable resource, which has been appropriated and marginalized by industrial capitalist societies in the global North and not properly studied and harnessed within African contexts to improve the quality of life in these societies. This was clearly stated in the following two narratives:

> We find that our parents are involved in so much indigenous technology, which has a scientific basis. We can start from there, making them aware that there is a scientific component in what they are doing. Science is important for our country's development, and everyone should be informed and aware. Sometimes, we discard our own knowledge systems in favor of modern ones, which may not always be appropriate for our own environment. We need to document our own knowledge systems. (Bouku Kelfa, Senior Lecturer, Plant Pathology)

> Modern technology has come to overshadow indigenous technology, but there are many indigenous practices. If we were to study them, we would see their benefits to society. We should encourage this, so that the two could be married. We shouldn't sideline them, because we feel that their technology is archaic. There's something we can learn from them. Most of their technologies are environmentally friendly. (Dr. Bisi Leona, Lecturer, Zoology)

As Drs. Leona and Kelfa noted in this study, many studies acknowledge the benefits of making more effective use of indigenous science and technology systems (for example, Brokensha et al. 1980; Richards 1985, 1996). Of relevance to the African experience, however, is the critical issue of who benefits from the products of this knowledge and how those who produce this knowledge are positioned in the decision-making and allocation processes. Who becomes the legitimate owner of the product? Three of the study participants placed some blame on the government for its lack of knowledge or vision for science and technology development in the country. They argued that this lack of vision has impeded progress in producing creative and appropriate scientific and technological innovations for societal needs. Both narratives strongly recommend that scientists participate more in politics, so that their interests might be more effectively represented in the decision-making processes:

> I don't know what is wrong with politicians, but we need to get some science into politics to lobby for change. We have to be where decisions are made. (Dr. Kade Lalla, Senior Lecturer, Biochemistry)
>
> We need good science and technology policies. Scientists should also go into policymaking. We have to have this dual role; if not, it will not be part of the national agenda. A lot of us are not in policy. We need to filter these things into the national agenda, so it goes beyond the lab. We need to attend more workshops and get our voices heard, because we will turn the wheels of industry to transform our natural resources. (Dr. Amadi Conte, Lecturer, Pediatric Nutrition)

Impact of Economic Restructuring

Since the 1980s, Ghanaian universities have experienced a significant decline in educational budgets, severe overcrowding of classrooms, declining quality of science training, and shortage of good faculty, due to the debt crisis and neoliberal economic restructuring of higher education. Finding ways to address these problems has intensified work practices and

impeded the professional development of academic personnel in the three public universities studied. Many faculty left the universities for better paying employment abroad or in the local private sector. Some took on part-time employment to supplement their meager salaries. Among the study participants, only the two professors and one senior lecturer were in university employment in Ghana prior to this period. Two associate professors were hired in the early 1980s, and three senior lecturers in the mid- and late 1980s. Among those employed in the 1990s, two had been promoted to senior lecturer. The remainder who were employed in the 1990s and after 2000 were at the rank of lecturer.

The economic conditions described here hold serious implications for women scientists in this study, because most of the women are in lower academic ranks. This means that they are likely to teach more than their male counterparts and have fewer research funding opportunities to advance their career goals. Study participants expressed their frustration in different ways, emphasizing multiple responsibilities in the academy, teaching responsibilities, lack of funding for research, poorly equipped labs, and failure to meet publication goals. Several also mentioned their domestic responsibilities, a problem most often used to explain their failure to advance to a higher academic rank. Some of these concerns are explained in the following narrative:

> [My responsibilities include] teaching, research, supervision of students, and committee work. Because we are the youngest lecturers now, we get to do the donkey work. I do all the work allocated to my senior colleague and I. By this stage, my plans had been to be more advanced by now—more papers, more research. I had hoped to have invented something and publish more. Science in Africa is really going down. (Yanor Dean, Lecturer, Physics)

This narrative shows how those at the lower level of the academic hierarchy bear the brunt of teaching, mentoring, and other managerial responsibilities in grossly underfunded and understaffed departments. It is clear that junior faculty often have to sacrifice their career advancement by way of research publications to keep their departments functioning.

The lack of funding opportunities for research and publishing is another issue raised by a number of the study participants. As already mentioned, under new economic reforms, there are increasing demands for greater productivity, often measured in numbers of research publications and grants. Between 2002 and 2008, Africa's scientific productivity in the

form of publications amounted to 2.0 percent of the world's total, principally because of contributions from South Africa and North Africa. In terms of areas of specialization in scientific knowledge production, Africa is relatively strong in biology, which reflects African countries' socioeconomic needs and geographical opportunities (UNESCO 2010). In terms of the number of patents produced—an indication of growth in intellectual property rights—the majority of African countries are not represented in this category of scientific output (UNESCO 2010). The production of publications and patents is a significant indicator of knowledge creation, which demands hours of fundable research and grant writing to be successful. Most faculty in scientific disciplines lack these opportunities, particularly women and junior faculty. For example:

> No. I expect to have more. The problem was maybe lack of funds to do meaningful research. You are thinking about what chemicals to use, how to obtain them, even basic alcohol. [There is a] lack of motivation because of lack of funds. (Dr. Fatu Dena, Senior Lecturer, Pharmacy)
>
> Yes, in science, there are scientific meetings. The main problem is funding. I am unable to get funds because I am not actively researching. Even to get grants for funding, you need a bit of data to write your proposal on. There are some basic equipment needs you should provide, based on initial investigations. People say do something, but you can't do something with nothing to do it with. There are no incentives. (Dr. Mariama Bull, Senior Lecturer, Biochemistry)

Gender discrimination in the workplace is another example of the marginalization that women scientists experience in Ghanaian universities. Working in a patriarchal institutional culture lends itself to discriminatory policies, male domination in the workplace, and lack of sensitivity to particular concerns affecting women in the workplace:

> A lot of people think that for a woman to get this far, you have to sleep your way through and use your femininity as a banking chip. In Africa, people feel you were pushed up, I'm sure. With the funding, you have to prove yourself before money will be released for you to do a certain project. Sometimes when you go to the field with your male colleagues (for example, the bush), they feel you are not physically fit to do so. Because you are a woman, you are not as brave. It's annoying when you know you can do it. (Dr. Bisi Leona, Lecturer, Zoology)

> As a woman it's very difficult, because I am doing experimental work. I have to keep on talking to the technicians, sometimes give them money or give them an official letter to do the work. It is difficult to stay in the lab at night as a woman, so sometimes I'll ask my male colleagues to take readings for me. After 7:00 p.m., it's difficult to stay in the lab. (Dr. Yanor Dean, Lecturer, Physics)
>
> Women, when they reach a certain point, can't move on because they are a threat. It is time we got a woman vice chancellor. It's really hard to move ahead as a woman once you are at par with them. They don't want you to go above them; otherwise, you'll be in trouble. Even in the homes, a lot of husbands won't let their wives go up for a PhD. (Dr. Fatma Gidwa, Lecturer, Pediatric Nutrition)

These experiences are not necessarily different from those of women counterparts in other societies, even in the global North. They are a consequence of social exclusion, as Etzkowitz, Kemelgor, and Uzzi (2000) explained. They pointed out that these constraints emanate from a patriarchal culture that tracks and values men and women differently and is, in turn, reinforced in a patriarchal institutional culture through discriminatory practices and social networks that marginalize women. This is articulated by several of the study participants. For example, one person was allotted a heavier teaching load, because her research productivity record was posing a threat to her male colleagues. Dr. Gidwa expressed this frustration in her statement that it was high time a woman was appointed as vice chancellor at her university.

The restructuring of higher educational institutions in Ghana, as a result of economic reforms, has also developed a very competitive culture and less of a culture of collegiality and cooperation. This type of culture tends to benefit men more than women, which leads to increased social isolation. This is clearly articulated in many of the experiences of women scientists in this study, with respect to how cultural attitudes and practices relating to women affect attitudes of male colleagues and support staff, essentially because the scientists are women.

Promoting Sustainable Science through Community Engagement

Although neoliberal economic reforms in higher education have caused some discomfort and disadvantage for women in the academic profession, because of the multiple roles that women perform in their daily lives,

women have exercised agency in determined ways to correct gender imbalances in science and technology. As earlier mentioned, in some countries, women's movements are appealing to the global women's movement and the United Nations to hold their governments accountable for discriminatory practices affecting gender equity. In other cases, feminist academics are demanding from their universities transparency in institutional practices, particularly, in high-ranking administrative appointments, while in others, women scientists are using their research to inform education, social, and economic policy. In my study of women academic scientists in Ghana, there are two examples of ways in which they have engaged in civic society initiatives to promote gender equity and popularize science and technology in the wider society. The first pertains to the science and technology clinics for girls designed to promote girls' access, participation, and retention in science subjects. University professors, teachers, and nongovernmental organizations, among others, provide information about science and technology opportunities, mentoring, and interaction with the students to encourage their interest in science and technology subjects and to encourage them to continue onward to science-related careers.

> With the Ghanaian girls, when we started, the thing was for girls not knowing what to do with the science core courses that are available. I have heard that in the past; the universities sent people like that to the medical schools. That has stopped now. Because of that, everybody who was good at chemistry, biology, was aiming for the medical school. But there's pharmacy, there's biology. If you tell them what they can do with a basic biology degree, then they are quite happy to do that, knowing that they can, you know, channel out into other things. And those who've done math, they come in to do engineering, computer science, the various branches. So, it's been good. Yes. (Dr. Rugi Turay, Associate Professor, Physics)

The other initiative is the national science and mathematics quiz program, which is a private sector initiative designed to encourage scientific literacy formally and informally (UNDP 2000). This quiz program has become a form of popular entertainment, with viewers drawn from all sectors of the population. One of the more popular segments of the program is the focus on science in everyday life. It is a first step toward integrating science into the culture and popularizing it in ways that will demystify science and raise public awareness of science and technology as a potential career path and a central feature of the nation's development agenda.

> [A group of us] started a weekly television show for secondary schools. It is so popular. I think it's the way we created it. [Our objective] is to popularize public understanding of science, so that even though it was aimed at high school kids to help them learn their science, we've modified it in such a way that everybody is watching. In fact, there are [the] sort of questions that relate to everyday life, sort of. People meet you, even market women and say, "Don't I know you somewhere?' And, I would say, "Do you watch TV?" and they would say, "Oh, thank you." So the public even appreciates that aspect. (Dr. Effie Dogu, Professor, Biochemistry)

By applying their intellectual insights to civic engagement programs, such as promoting science clinics to encourage more schoolgirls to take up science and launching popular television quiz shows on science for schools and the general public, Ghanaian women scientists demonstrate ways in which universities can promote more gender-equitable institutional cultures and show leadership, as sites for the production and dissemination of knowledge in the wider community.

Conclusion

In recent decades, African governments have progressed in their support and promotion of scientific development on the continent through financial investment or pledges of investment, as a percentage of their GDP, in research and development, establishment of ministries of science and technology, and science and technology development plans. The extent to which these goals can be realized depends greatly on the maturity and capability of local scientific institutions to generate and disseminate that knowledge. Although universities provide the institutional medium to effectively develop science and technology through teaching, research, and learning initiatives, they are constrained by the lack of a critical mass of scientists; lack of a sustainable scientific research infrastructure; and social, political, and economic constraints facing the continent.

Women and gender equity constitute essential components of the resources and new capacity needed to promote sustainable and equitable scientific and technological development in these countries, but not much attention has been given to this sector as a potential resource. A number of deficiencies are apparent when women and gender equity issues are considered. The most critical are the lack of research on women as a resource for capacity building; lack of gender-disaggregated statistics as a

basis to compare how men and women are positioned in access, achievement, and the opportunity structure; and a paucity of gender-related case studies and policies to address institutional practices that create unfriendly and chilly academic climates for women as students, faculty, and administrative staff. Neoliberal economic reforms, which have been undertaken to address the economic crisis facing universities, have also had negative consequences for women's career trajectories and opportunities in scientific and technological disciplines.

It is clear from this study of women academic scientists in public universities in Ghana that a strong patriarchal and masculinist culture permeates relations of power in the university structure, and that this holds negative consequences for the comparatively low percentage of women in the academic scientific community. The concerns of study participants provide some understanding of how women in university employment are situated in framing science and technology as a policy objective and how they navigate these conditions, shape their own understandings, and situate a shared membership through community engagement.

Most of the participants in the small study sample are concentrated in the lower academic ranks and have very heavy teaching loads and few research opportunities to advance their career goals. Gender discrimination also marginalizes women in the workplace. There is a lack of sensitivity to their particular concerns and misogynistic attitudes pervade professional relations among faculty, promoting unequal gender outcomes. This is clear in accounts of women faculty being accused of engaging in sexual transactions to gain career advancement. Women are also underrepresented in senior academic and leadership positions. This scenario is likely to continue unless gender equity becomes a systematic component of university policy frameworks (Manuh et al. 2007). Without a critical mass of academic women in universities, particularly in the sciences, more investigations may need to be done to examine what kinds of administrative positions the small pool of qualified women is being absorbed into. According to Mama (2003, 118), the majority of women in leadership positions in African universities are often in appointments relating to the welfare of students, human resources, or administrative and support services requiring "a feminine touch." Sometimes such appointments are achieved at the expense of the women becoming accomplished researchers and intellectual thinkers, another area in which there is a paucity of African women (Mama 2003). As Mama (2003, 118) pointed out, "women do not at times find it expedient to substitute administrative experience for academic excellence."

Family and child care responsibilities also affect women's abilities to meet the competitive demands of their careers, in the absence of institutional support structures and changes in the gender division of labor in the household and male-dominated work environments in African universities.

The women scientists in this study are capable researchers, intellectual thinkers, and leaders. Although their contributions to the production of knowledge and expertise are marginalized and undervalued, they are pivotal to the needed transformations in the developmental agenda for science and technology development in their society. Morley (1999, 6–7) described academic women as "knowledge agents, micropolitically making interventions" within their universities and the wider society. I have also pointed out that in spite of their constraints, Ghanaian women scientists bring positive understandings about the broader social purpose of science and its ability to transform the quality of life in their society. This is clearly demonstrated in their perspectives on the role of indigenous scientific knowledge in their society and their involvement in civic society development initiatives that popularize science and raise awareness about the potential of science as a career option. The challenge that lies ahead requires strong and transformative institutional policies and programs, which provide leadership and commitment to gender equity in all sectors of production and dissemination of scientific knowledge.

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CHAPTER 7

Education and Human Capital Development among Geographically Isolated Regions and Marginalized Groups in Kenya

Serah Shani

Introduction

I walked into a manyatta (Maasai homestead) on a Friday morning and caught a view of 20 to 30 children playing outside their kraal. At 10 o'clock in the morning on a bright and shiny day, these children should have been in school. I asked several of them why they were not, and they told me their teacher who lives "on those hills" had not yet arrived. Those hills were about eight kilometers away, near a trading center where teachers could get housing, since the school did not provide it. Unconcerned about their teacher's lateness, they dismissed me and continued playing, shouting and laughing as if that were how their life operated in that part of the world. I later visited their school, a classroom made of wood, with two latrines overused by the number of children and the neighboring community. A few meters from the school, there was a water hole. One philanthropic group who visited this village realized that women traveled

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a long distance to fetch water and decided to drill a well. During the day, I saw many women walking back and forth to this centralized resource. Back in the village, the children's mothers were making beadwork to sell to tourists, fascinated by Maasai culture. With a plethora of ornamental displays, they attracted tourists, bidding for the highest profits by relentlessly negotiating for better prices. These women worked the whole day in the scorching sun to raise money to support their families. The tourists arrived in land cruisers with bottled water, snacks, and expensive cameras.

It was already May, but the rains that usually arrive in April had not yet appeared, so the seasonal rivers were still dry when they were expected to have rushing water. I counted up to 10 dry rivers, as we drove across villages. A few comprised only a mixture of mud and brownish-yellow water, but the rest were completely dried out. Cows had not returned from their migration for greener pastures, except for the few left behind to survive on the meager resources of the dry season to support people who could not migrate. The lack of cows created a scarcity of milk, meat, and other animal products that make up the greater part of the Maasai diet. The common statement in every home was *ekiata olameiyu*, which means, "We have trouble obtaining food because it is a dry season."

The distance from Nairobi to some of the villages I visited in the heart of Maasai land is about 240 kilometers. However, the villages are located about 10 miles from luxurious hotels, hosting tourists from all over the world, who are fascinated by Maasai culture, wildlife, and scenery. The area has about 12 venues, mainly lodges and tented camps. About 30 kilometers from these hotels, an airport gives tourists and elite travelers options to travel by plane (about 45 minutes) or by road (about three hours). In this remote region, in the middle of nowhere, there is access to high-tech facilities, like credit card machines, bottled water, running hot and cold tap water, laundry services, swimming pools, and diverse vehicles from different companies operating safaris—creating an island of affluence in an economically underserved community. Maasai families, threatened by drought and the seasonal loss of cattle, expressed admiration for the way the tourists live. The Maasai mentioned seeing food and both bottled and running water in these five-star hotels during the drought and expressed the desire to educate their children, despite the many challenges, so, like tourists, they can have access to these luxuries.

While these rural areas could be lumped together as poor and needing help, I observed different socioeconomic divisions between rural, elite households, such as those of the principal of a primary school, the local

chief, and the people who run the tourist industry in these villages. The members of these households, though few, told me they could afford to take their children to a private Christian boarding school outside the rural area. Others could pay for transportation to take their boys and girls to a school about 12 kilometers away. The majority, however, could not educate their children beyond the first or second grades of elementary school. More importantly, parents indicated that if they were able to make choices in a wildlife environment, they would always choose boys, not only because of their patriarchal culture in which boys are more advantaged than girls, but because they regarded the environment as more dangerous for girls.

The Maasai live near these tourist facilities in two counties, Kajiado and Narok, the homeland for the Maasai communities, with a game reserve and a national park, respectively. While the Maasai people are largely lumped together conventionally as one homogeneous group socioeconomically, they are very heterogeneous in educational attainment, wealth, and living standards. However, a greater majority, taken in statistical aggregate forms, still lag behind their counterparts, who live in much more affluent and better served counties. They continue to lag behind many parts of the country in economic development, educational attainment, and infrastructure, such as buildings and roads and health facilities (Galabawa 2001; Switzer 2009). More significantly, gender inequality is rampant in educational attainment, with girls underserved compared to boys (Switzer 2009; UNESCO 2010; Yara 2012).

While some literature has focused on the Maasai disinterest in education, depicting their culture as static in an evolving, and sometimes revolutionary, globalized world, a majority of the Maasai who I interviewed were very interested in their children's education and wished their children would go to school and gain prestigious careers. Cattle rearing, the basis of their economy, faces numerous challenges: harsh and unpredictable climatic conditions; land ownership and fencing; government restrictions on movement; grazing restrictions in wildlife reserves and game parks; the affluent lifestyles of the educated; and the luxurious lives of tourists. An elderly man, about 80 to 90 years old, sat by the fireside and told children's stories. He emphasized the desire for education and the luxurious life of the white tourists, who come to their village and the nearby tourist lodges. A discussion with a group of elders and community activists revealed that the Maasai also admire cars, bigger houses, and financial stability. While the Maasai have a fascinating culture that attracts many tourists, globalization and technology continually challenge their

desire to keep their culture unchanged. The Maasai groups are still negotiating their spaces in debates about development and globalization.

Driving from Nairobi toward one of the counties where most of the indigenous Maasai live, the degradation and inequalities of all social amenities become apparent, as you move away from the big city: from tarmac roads to corrugated roads to almost impassable, weathered roads; from brick houses to wooden houses to mud houses; from cozy schools and school bus transportation in Nairobi to children walking for miles to go to school in the rural communities of Kajiado and Narok. These layers of inequalities have been dichotomized into rural versus urban resources, but the spectrum is too diverse and dynamic to fit into these broader categories, especially when also considering the major slums surrounding Nairobi.

Stories and experiences of the many Maasai girls living in the most remote areas provide an example of one context. Instead of islands of success, as seen in poor US inner city neighborhoods, where a few schools succeed against all odds, the Maasai regions are characterized by educational deprivation, commonly referred to as "hot spots" on global and international educational maps (UNGSD 2015).

Using the case of girls from the Maasai communities, this chapter aims to elucidate inequalities in education and the marginalization of girls among poor, indigenous communities. This debate occurs within the broader global and international discussion of policies related to the education of women and the implementation and implications for development. What has worked, and where has it worked? Where has it not worked and why? This chapter will conclude with recommendations about what could be done to help address girls' education in marginalized groups of the Maasai of Kenya.

Although globally and internationally, there seems to be greater success in girls' education, especially when viewed in aggregate statistical forms, many marginalized girls still face basic challenges, such as access to a school, making it difficult for girls in these marginalized groups to benefit from improvements in girls' education. Education has been identified as one of the major mechanisms for social and economic development, which mostly translates into good health, better standards of living, good governance, and better environmental sustainability, among other outcomes (Gachanga 2005; Omatseye and Omatseye 2008; Ferré 2009). For girls, education lowers fertility and mortality rates, improving their overall health (Oxfam 2008). It is, therefore, almost inevitable that Africa invests in education and the development of human capital. Many African countries have recognized

the importance of education. Since the correlation between girls' education with improved maternal health, economic development, and women's autonomy has long been established, and girls' education continues to lag behind boys' in hardship areas, the struggle continues. Low registration and graduation rates, early marriages, high dropout rates, early pregnancy, forced marriages, and child labor characterize the outcomes for many girls in developing countries (UNESCO 2006).

This chapter begins with an introduction explaining the basis for my argument. The methodology used during my fieldwork among the Maasai villages then follows. In the topic of education and human capital in Africa, I delve more deeply into the education of girls from marginalized groups. Disaggregated data could identify the particular households and individuals needing help the most, information now hidden in categories lumped together. Using the example of Kenya, the chapter also addresses issues related to marginalized groups and communities, looking specifically at the pressures among Maasai girls, and offers recommendations for meeting their educational needs. The last section provides conclusions.

Methodology

From an anthropological perspective, I am interested in how education takes place in different cultural contexts and how social, economic, political, and historical situations affect the process of learning. This chapter is part of my broader study in an ethnographic research project conducted in Kenya. Beginning in December 2013, I started a pilot study on education and elite formation among marginalized groups in Kenya, specifically, the Maasai ethnic group of Narok County. The ethnographic research involved mostly participant observation in the Maasai villages and schools and informal interviews with parents, children, teachers, community leaders, and community activists. I went back in the summer of 2017, and conducted 25 more formal interviews with the Maasai among the emerging educational elites from both underprivileged and privileged neighborhoods. I have also done archival research in databases to review countries' educational statistics and other information about Maasai girls and their contexts. My interviews with educational elites led me to some of the villages where most Maasai children grow up. This chapter is based on children's experiences in these rural areas. Most importantly, the socioeconomic aspects of different households and their influence on students' access to

schooling became apparent. Further, the gender dynamic, where girls faced greater challenges in gaining access to schooling, drew my attention.

As part of this broader research, I am interested in gender equity and schooling. I want to unravel why and how, currently and historically, women have been left behind in education. Preliminary findings indicate that social and political institutions have historically shaped and preselected elite paths for Maasai girls, which reflect economic inequality among different households and neighborhoods, even within these marginalized and geographically isolated groups. While the conventional knowledge that most Maasai girls are not educated holds some truth, especially in aggregated statistical comparisons with other ethnic groups in Kenya, there are girls from privileged backgrounds who have had a long history of access to schooling and have added to the human capital needed in the country by taking prestigious jobs, such as university professors, medical doctors, and political leaders. Encountering this experience of elite women led me to the question: What are the educational experiences of other girls in marginalized, isolated, and underserved geographic locations in the Maasai community? How do they vary by households? What are girls' educational needs? My findings indicate that the majority of other Maasai girls in rural areas continue to experience hardship in gaining access to education.

Education and Human Capital in Africa

In the wake of independence, most governments in developing African countries invested in creating human capital, aimed at increasing work forces for developing the nations. Education was not only seen as the most viable means to social and economic development but also as a panacea to a plethora of other sociocultural, political, and economic problems. Through multivariate methods, these new African economies have appeared to improve over the years. While Africa has generally made substantial progress in human development, with poverty levels falling, incomes rising, and educational and health indicators showing considerable improvement, gender inequality persists in many geographically isolated regions. Marginalized groups from these locales continue to experience lack of access, poverty, poor education, and extenuating health concerns. Lay people use rhetoric such as, "When you educate a girl, you educate a community, and when you educate a boy, you educate an individual" (Lockheed et al. 1980; Hanushek and Woessmann 2007). These

efforts have been effective in improving girls' education overall, especially when taken in statistical aggregate forms (Summers 1994; Behrman and Sengupta 2002; Herz and Sperling 2004; Hanushek and Woessmann 2007).

However, many girls in marginalized groups and geographically isolated communities live in harsh climatic conditions and continue to face many challenges. In addition to the challenges already mentioned, these girls are also hardest hit by second-generation issues facing their counterparts, such as lack of access, safety, quality, transitions, and leadership in education (Hall and Patrinos 2006; Hallman and Peracca 2007; Hannum and Adams 2007). Being marginalized and geographically isolated from most government social amenities, such as schools, universities, and hospitals, those who do gain access to primary school have to travel many miles to boarding high schools, and later, to big cities to college and university, making the transition from primary school to high school and other tertiary institutions extremely challenging. Only recently has Maasai Mara University opened in Narok County, the first university among the Maasai. This underserved region creates a concern, as their dismal situation prevents the improvement in girls' education witnessed globally. Though Kenya has recently worked on decentralization, most geographically isolated and marginalized groups continue to struggle. This phenomenon of inequality in development is seen in many African countries. The areas of European interest during the colonial administration period created a system of "haves" and "have nots," as social amenities centered on European settlements and their surrounding communities. One could argue that development continues to occur in areas that were colonial settlements. People and lands of no interest to Europeans, therefore, remained largely underdeveloped. After independence, these economic structures and institutions were perpetuated in newly formed governments, as more schools, hospitals, and other infrastructures remained in former European settlements and areas of interest. These colonial prioritizations later influenced the distinction, and sometimes construction of the dichotomy, of rural versus urban. Geographically isolated and marginalized ethnic groups emerged, because centralized amenities were used as points of reference: the distance from university, hospitals, schools, and good roads. There is, therefore, not only the need to continue the debate about development in Africa but also to substantiate inequalities within geographic regions and populations in a country to address inequalities in development.

Girls' Education in Africa

While the global statistics are staggering, tremendous progress has occurred in the development of girls' education at the elementary school level (UNESCO 2018). According to the Global Education Monitoring Report: Gender Review, "Between 2000 and 2015, the share of countries that achieved gender parity in primary education increased by 8 percentage points and in upper secondary education by 14 percentage points…Gender disparities in out-of-school rates have narrowed substantially over the last 15 years" (UNESCO 2018, 11). However, sub-Saharan Africa is still home to the largest number of children who have not had any access to schooling. Girls are still the ones more disadvantaged than boys (UNESCO 2017). In addition, even when we look at adult literacy as an outcome of education. Two-thirds of non-literate adults around the world are women, a figure that has not changed since 2000. This gender disparity remains one of the persistent challenges in adult literacy and education (UNESCO 2017). Hence, the struggle for girls' education still persists. Among minority communities, in which access to school is challenged, being a girl aggravates the situation, since girls are more vulnerable than boys, who are sent to school before girls, especially where safety concerns are rampant. In Africa, the most underprivileged girls from rural backgrounds continue to face educational challenges. A shift to focus on these pockets (hot spots) of underprivileged girls in Africa is crucial to achieving equality.

According to Winthrop (2010), sub-Saharan Africa's economy is booming and is almost comparable to the BRICS economies, which include emerging economic powers such as China, Russia, and Brazil. With a projected growth rate of 4.5 percent in 2011, Africa can no longer be ignored (Winthrop 2010). Africa is considered to have been quite resilient during the global financial crisis, recovering faster than Latin America, Europe, and Central Asia. Improving education in Africa is an important part of developing the skills needed to transform Africa into a global economic powerhouse (Winthrop 2010). As we have heard previously, Africa has made important progress in increasing school enrollment, but a crisis in learning exists across the continent (UNESCO 2012).

Girls' Education in Marginalized Groups

For decades, the education of girls has been studied academically, discussed in policy debates, and has been the focus of projects aimed at improving girl's education. While there has been tremendous improvement in girls' education, girls from indigenous and geographically isolated ethnic groups continue to face challenges related to access, transition, quality of education, and leadership capabilities (Hillman 1994; Krätli 2000; Anderson and Broche-Due 2003; Carr-Hill and Peart 2005; FAWE 2009). Educating girls has been associated with eradicating extreme poverty and hunger, eliminating gender disparity in education, improving wage employment, participation in the national parliament, and achieving nutritional and health benefits. Women who are educated and are employed are more productive, gain greater control over family income and decision-making, and invest more in their families (Madhavan and Thomas 2005; Martinez and Waldron 2006; Lesorogol 2008; Omatseye and Omatseye 2008; Oxfam 2008; Ferré 2009). A World Bank study (Hanushek and Woessmann 2007) estimates that women and girls who earn income reinvest 90 percent of it in their families, promoting better health and future productivity. These benefits of educating women spill over to their immediate families and eventually to the whole community.

However, girls from marginalized communities have the most disadvantages. They may face gender discrimination as most of them come from patriarchal cultures; their geographic isolation creates distance from most educational institutions, especially high school and other tertiary institutions; and they come from indigenous minority groups with less say in education policy. While the world has now gravitated toward second-generation issues facing their counterparts such as safety, leadership and quality of education (Hall and Patrinos 2006; Hallman and Peracca 2007; Hannum and Adams 2007), many girls from marginalized communities do not yet have access to schooling.

Disaggregation

Researchers have been able to statistically disaggregate and aggregate girls' education experiences by global regions and even by ethnic groups. However, important details are missing. There needs to be more statistical disaggregation of girls' education experiences from global to minute details, such as households and specific individuals. Equally important are

ethnic groups, neighborhoods, and households, as well as the socioeconomic status within each group. Viewing the Maasai people as all nomads or semi-nomads in conventional debates, considered disadvantaged at every level, ignores the elite and educated among them. The lack of a heterogeneous outlook among indigenous communities could contribute to a lack of access by those in dire need of resources and benefit only elite groups who primarily act or pose as gatekeepers, opinion leaders, community representatives, and the channels through which development gets approved. While this clique among groups is important, everyone needs to be engaged, to disaggregate which particular Maasai girls from which households or particular individuals need which specific educational resources, and which girls have or lack access to social amenities such as schools, hospitals, and universities. One-size-fits-all does not apply, as each category, group, or individual has some unique problems that vary across the socioeconomic continuum. Even with the marginalized and geographically isolated populations, stratification abounds, with some more underserved than others. This layering becomes crucial, because most of the time, resources do not trickle down to the ones in dire need who require extra assistance.

Most marginalized communities have distinct histories and unique challenges. For pastoralists like the Maasai, Turkana, Samburu, and Pokot, insecurity is heightened due to cattle rustling and clashes over water resources and grazing land. Yet, among these communities, although all are nomads and face similar problems, those in northern Kenya also live in constant fear of terror attacks from shifters and al-Shabab, making security a major concern. The worst attack occurred at the Garissa University, where more than 147 students died. The Maasai live near game reserves and national parks, making it unsafe for girls to travel long distances to school. Women from hunter and gatherer groups find themselves displaced and forced to live as squatters, while fisherwomen like the Abasuba face environmental degradation and fluctuation of fish prices (Anderson and Broche-Due 2003; Branyon 2005; Bonini 2006).

Kenya

Since independence, Kenya has prioritized education as one of the main goals toward economic development (Branyon 2005; Gachanga 2005; Sifuna 2005, 2007; Mathooko 2009). Kenya has engaged in and subscribed to national and international policies and declarations to enhance

education and make sure all children have a right to a good education. At a national level, Kenya has had various policies. For example, in 2006, the Early Childhood Development and Education initiative aimed to meet the learning needs of children, youth, and adults by 2015. The 2008 Kenya Vision 2030 sought to provide a globally competitive education, reduce illiteracy, and improve transition rates and quality. The enactment of the new constitution in 2010 instituted free and compulsory primary education (Mathooko 2009; Republic of Kenya 2010). In 2012, the policy of technical and vocational education and training was also introduced. At the international level, Kenya subscribed to Education for All (EFA), Dakar Framework for Education, and in 2000, the United Nations Convention on the Rights of the Child (OHCHR) and the Millennium Development Goals (MDG). The status of education in Kenya is presumed to have greatly improved. According to UNESCO, Kenya is achieving gender parity in primary education enrollment and near parity in secondary school enrollment. This gender parity does not mean universal access has been achieved, because boys' and girls' enrollment still remain very low at 51 and 48 percent, respectively.

Marginalized Groups and Communities

The Kenyan constitution makes a distinction between marginalized communities and marginalized groups. Groups consist of women, children, the disabled, and the elderly. Communities encompass many ethnic minorities and indigenous peoples. The new constitution considers women, as a whole, to be marginalized. Marginalization by gender in education stems from a history of colonialism and Christian religious schools that educated more men than women, including gendered selection of careers, in which women took more jobs with subordinate positions and at less empowering levels while men engaged in more technical, administrative, and leadership positions (Shani 2006). This career–gender determinism worked well with the majority of patriarchal societies. Geographic advantage also played a major role, as demonstrated by the history of European settlers in central Kenya, that is, the so-called white highlands. In areas of interest to them, the Europeans developed schools, universities, hospitals, and communication infrastructure. Areas of no interest lacked universities for many more decades, after those in the Nairobi area were constructed. As mentioned earlier, Narok County, where many Maasai reside, only opened a university in the twenty-first century. These

areas are also geographically isolated from all major social amenities. Only recently, five decades after independence, decentralization of institutions of higher learning took place.

Pressures Among Maasai Girls

Most of the pressures for girls' education in Kenya fall into major categories: influenced by political administration of the country and the allocation of resources; socioeconomic status of most Maasai households; environmental factors; and cultural perspectives (Ipensburg 1992; Alwy and Schech 2004). Only 48 percent of Maasai girls in Kenya ever enroll in school, and of those who enroll, only 5 percent ever reach secondary school. Girls' dowries have been important sources of income for parents for many years, making girls more likely to be married at an early age. Female genital cutting, a rite of passage that takes children out of school to be circumcised and then married, worsens the situation (Lopes 2001; Shadle 2003; Coast 2006; IPPF 2006; Messing-Mathie 2008). Living within a patriarchal setting, women face unprecedented poverty and a lack of economic opportunities, as they are not entitled to own either land or cattle. Traditional gender roles, with women doing the bulk of the work at home and then married off, favor the education of boys, who carry on the family name. Access to education is a problem for girls, who have to travel many miles to go to school; thus, parents opt to send their boys to faraway schools, rather than their girls, as I witnessed in the villages I visited. This is even more prevalent in areas where insecurity abounds and where wild animals live. Ecological and environmental degradation, resulting from global warming, challenges the economic base of the Maasai, and their main sources of income are quickly disappearing as rainfall and seasons become more unreliable. Selling cows, as a means to raise school fees for secondary schools, and the many hidden costs of a "free" primary school education, such as uniforms, books, pens, pencils, and school development funds, become a problem. Unpredictable droughts have continually reduced the number of cows, further weakening the Maasai's main economic resource.

As one of the MDGs, universal education is of paramount importance, and so is gender equality (Lewis and Lockheed 2006). Though more girls than boys are enrolled in schools in Kenya, they still lag behind boys in isolated and marginalized communities. These geographically isolated

communities are mostly in northeastern Kenya, coastal regions, and some parts of the Rift Valley (Alwy and Schech 2004).

The Maasai ethnic group, the population discussed in this chapter, has low enrollment, poor attendance, and limited transition to various levels of schooling. In a patriarchal society and in poor households, the education of sons is sometimes supported at the expense of their sisters. Many complex and competing explanations are given in statistical aggregate forms, but it is generally accepted that girls in more marginalized groups experience more pressures than those of the majority group (Messing-Mathie 2008). The following are political and socioeconomic factors that pose challenges for Maasai girls.

Political

When looking at educational attainment among Maasai women in Kenya, it is imperative to consider regional disparities and the unequal distribution of resources that render many areas poverty-stricken, while a few privileged regions flourish. The social, political, economic, geographic, and historical backgrounds of many parts of Kenya have shaped the have-and-have-not dynamic that is also visible in other parts of Africa. The regional inequalities can be traced to the British colonial system, in which educational, political, and economic resources were unevenly distributed throughout the country. The contemporary Kenyan governments seem to have perpetuated these regional disparities. Therefore, following independence, there have been more qualified teachers, well-equipped schools, lower dropout rates, and better exam performances in the economically and politically stable regions, in contrast to poorer, far-removed, semiarid areas of the country, such as the Northeastern Province, the coast, and some parts of the Rift Valley (Ipensburg 1992; Alwy and Schech 2004).

Abagi (1997, 42) argues that "regional differences in the provision of education opportunities for girls correspond with regional variations in economic and political development in the country." Education for women in Kenya has differed greatly by region in the past five decades in categories such as the number of girls enrolled per year in primary schools, the number of those who move on to secondary school, and the number who drop out (Abagi 1997; Alwy and Schech 2004). The highest dropout rates for women can be found in the rural areas, while higher retention rates and transitions to secondary school are mainly in the largest municipalities and highly agricultural regions such as the Central Province. Areas like the Central Province are highly fertile and are therefore the locations

where the colonial government and missionaries originally set up schools, churches, and hospitals (Ipensburg 1992; Vavrus 2003). The Nairobi area and surrounding Central Province in Kenya were privileged in this way. After independence, the government took over the schools there. Already stratified at independence, the classifications, location, and proximity to schooling resources formed the structure of inequality in access to education that continues to occur in Kenya.

Socioeconomic and Environmental

Given their geographic location, different communities adapt to different activities. The Maasai are an indigenous group in Kenya internally known for their persistence in practicing their traditions and adapting to change in the slowest ways possible. Maasai live in the semiarid Rift Valley regions of Kenya and Tanzania, and they own large herds of cattle, sheep, cows, and goats. They move seasonally in search of grazing grounds and water. Maasai women are responsible for all domestic tasks: milking cows, collecting water (a heavy and arduous task), cooking, and looking after the children. Given government policies, such as preserving parks and reserves, the traditional cultures appear to be challenged with increasing poverty and migration. Subdivision of Maasai land reduced the amount of land available for cattle, the number of cows per household, and food production. Once viewed as a proud and self-sufficient group, the Maasai now face socioeconomic and political challenges. Their economic base and nomadic lifestyle do not help, as there are no mobile schools and climatic conditions make water, food, and other resources hard to obtain. Their geographic location keeps them away from most government social amenities, making education a luxury beyond the basic needs of survival. In a patriarchal society, women are the last to be educated.

Recommendations

Addressing the status of girls from marginalized minority groups like the Maasai is a complex task, given the plethora of issues. Although there are many suggestions for addressing the educational issues of minority and marginalized girls, I suggest there is no one-size-fits-all formula. General suggestions have addressed general problems, but specific and unique problems from unique rural backgrounds—and especially, individual households—have not been addressed. Since girls' educational issues include a multitude of challenges (economic, sociocultural, political,

environmental, historical, religious, and security-related, among others), governments need to substantiate the specific problems facing each group of marginalized girls. For Maasai girls from Kajiado and Narok counties in Kenya in the most rural parts of the country, the greatest challenges are: access, as girls have to travel long distances; limited food; and unsafe conditions due to wild animals from the nearby Amboseli National Park and Maasai Mara National Reserve. Girls in northern Kenya face a different challenge: even those with access to education live in constant terror as a result of school attacks, like the most recent Garissa University shooting, which took the lives of 147 students. Ambushes in the nearby homestead and the killing of parents and other Kenyan nationals could also pose threats and trauma to girls, affecting their access to and enrollment rate in school. In these northern areas, therefore, ramping up security measures is crucial. While the two places are sections considered to have a majority of underserved girls, their problems are both general and specific and need to be addressed as such.

The government needs to invest in constant research and evaluation. For example, it is important to hear from the girls themselves. Their attitudes toward schools may be related to their own definitions of educational success, which may contradict the expectations of educational systems and institutions. Although scholars may develop generalized policies to improve girls' education, social scientists can attest to the fact that there is no single approach. Understanding meanings, values, and attitudes of girls from specific ethnic groups, socioeconomic status, geographic locations, and different levels of exposures to technology will help develop more informed, culturally competent policies, specific to place and time in ever changing and evolving communities. The girls' experiences in school will help build the knowledge base of what is required to improve opportunities and outcomes for girls—specifically, those in marginalized and geographically isolated groups—from the perspective of those girls that the policies are intended to help. This research can also be replicated in many settings and may yield similar or different outcomes, which may reveal unique, specific, or similar education policies and educational practices.

Disaggregating the rural, minority, and marginalized categories, which are normally taken together as homogeneous categories, can reveal the minute details of households or individuals. Locking these categories into statistical aggregation curtails the many differences inherent in them, and hence, prevents resources from reaching the needy, including for those

who do not even have access to schools and other social amenities available to elite groups in these communities. When available, resources for girls' education also get channeled through rural elites, raising questions about the trickle-down effect to the people really in need or preventing marginalized girls' awareness of such resources. These questions need answers: Who are the poor among marginalized groups? Which girls from which households need help? Which and what amount of help do they need? Disaggregation needs to reveal the minute details.

When debates occur about improving education for girls, most patriarchal societies have put men at the center of making decisions and providing economic support and security for their families. Women's decision-making is limited and faces challenges, as it is often solidified within men's settings and interpretation. Among the Maasai community, men pay school fees, as they own cows and land and children carry their father's names. Advocacy for girls' education and empowerment of their mothers would be more effective if the heads of families, who are mainly men in patriarchal communities, are convinced that girls' education matters. Therefore, fathers have to be engaged and must be a central part of these discussions.

Education outside the classroom needs to be emphasized. In many rural villages, there are few role models to emulate. Success stories include Kakenya Ntaiya, a Maasai woman who was betrothed to be married at a very young age, went through female genital cutting, and then managed to convince her village not to marry her off, because she needed to go school. She is now recognized as the first girl in her village to earn a college degree. She also holds a doctorate from the University of Pittsburgh. She went back to the community and started a girls' school. Moreover, she is married with two children and is considered to be a success in both realms: getting married and having children, and attaining the highest degree of education acknowledged worldwide. Her story has been covered by international media, and many girls and parents in marginalized areas would benefit from her experience.

More schools need to be constructed. While there are many ideas about how to improve schools for nomadic indigenous groups in the country, including the recent development of mobile schools, there is still a dire need to build schools for those students who have to travel three to five hours to the nearest schools. In northern Narok, for example, most Maasai combine keeping animals with farming crops. High rainfall and fertile soils in the areas mean the people are less mobile. It is different from the

semiarid areas in southern Narok, where there are limited resources for people to farm and feed their livestock. Grass and water are scarce in the dry season, leaving them no choice but to move to greener pastures. Since their migratory pattern is predictable and normally established every year (for example, from point A to point B and back within certain time periods), nomadic schools should be constructed at both locations. These will provide year-round access to schooling and improve the length of time girls spend in school. Distances to school in both locations differ, with longer distances in the semiarid areas than in northern Narok, with its highland vegetation (Phillips and Bhavnagri 2002; Ngome 2005; Sifuna 2005; Omolewa 2007).

Conclusion

In the quest for the best outcomes and equality, schooling continues to be seen as the main mechanism for developing human capital, a much needed resource for the newly established African nations. In the wake of independence in African nations, education was and remains not only the main viable means to social and economic mobility but the road to solving the problematic human conditions related to health, economic, social, cultural, political, and security issues. While there have been major strides in educational attainment for both boys and girls, girls are still lagging behind boys at all academic levels. Even when girls' education has improved overall, many geographically isolated and marginalized girls, such as the Maasai girls discussed in this chapter, continue to face basic issues of access that have been addressed in other areas. The girls may not join in the progress portrayed in statistical aggregate forms that omit the many girls living in underserved communities.

While it can evaluate success, this lumping together of girls' access to education by global, continental, and national statistical forms becomes problematic as the only means of measurement. More minute details need to emerge by disaggregating these large categories. For example, within the underserved communities of the Maasai girls, these questions need to be addressed: Which households have the greatest need for access? Which individuals within each household are most affected? What kind of challenges does each neighborhood face? Which students are near schools, and which are not? How are these communities stratified in their socioeconomic status? Who has the greatest needs? These forms of disaggregation can help capture minute details and could provide a more feasible means

for resources to trickle down to the neediest individuals. Since the girls in geographically isolated groups face ongoing challenges; the struggle for girls' education continues.

The importance of girls' education and the benefits that result cannot be overemphasized. Their education is closely linked to better heath and economic autonomy, among other improvements. More importantly, as mentioned earlier, the benefits that accrue to educated girls spill over to their immediate families, communities, and ultimately to nations, continents, and the world. Investing in girls' education should be one of the major policies under debate and implemented. While the world moves onto second-generation issues and challenges affecting girls' education, such as leadership, quality of education, and transition rates, many geographically isolated and marginalized girls have no access. Investing in access to education for marginalized girls becomes even more important, as it reduces inequalities that persist and can improve their livelihoods and the incomes of those around them.

The situations of most marginalized and geographically isolated girls are complex and may require multifaceted, specific, and unique approaches to address them. Creating mobile schools for nomadic groups, starting lunch programs in semiarid areas, increasing the number of schools, shortening the distances to schools, increasing security, constructing health facilities, and implementing any combination of these initiatives could help more marginalized girls attend school. Considering the big picture and the solutions is equally as important as discovering the minute uniqueness of each group, household, and individual. Therefore, planning and implementation of education development should include these specific factors.

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CHAPTER 8

The Education, Inclusion, and Development of Orphans and Vulnerable Children: Crucial Aspects for Governance in Africa

Jace Pillay

Introduction

The aim of this chapter is to point out that the early education, inclusion, and development of orphans and vulnerable children (OVC) is crucial for good governance in Africa. The reality of the situation in Africa is that the numbers of OVC are growing at an alarming rate, largely as a result of the HIV/AIDS pandemic (Ramsden 2002; Masondo 2004; Pillay 2012). In the context of this chapter, an orphan refers to a child who has lost one (single orphan) or both parents (double orphan) "due to AIDS, other illnesses, violence or other causes of death" (Skinner and Davids 2006, 1). This may also include desertion by, unwillingness of, and inability of parents to care for their children (Skinner et al. 2004). The definition of what makes a child vulnerable is complex and focuses on three core areas of concern: material problems, including access to money, food, clothing, shelter, healthcare, and education; emotional

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problems, including insufficient caring, love, support, space to grieve, and containment of emotions; and social problems, including a lack of supportive peer groups, role models to follow or guidance in difficult situations, and risk factors in the immediate environment (Skinner and Davids 2006, 2). There are multiple vulnerabilities to which children can be exposed from their early years, including HIV/AIDS and other illnesses, disability, poverty, limited access to services, violence, and substance abuse within communities, and physical, sexual, and emotional abuse or neglect (Desmond et al. 2003; Skinner and Davids 2006).

OVC are at greater risk of dropping out of school, and this poses an immediate and long-term economic and social threat to the development of African countries. Focusing on their early development is crucial, since research shows that the development of children into adults largely depends on the education and care to which they are exposed to during their childhood years. The early development sets the foundation for their success in later education, and thus, their preparedness for the future workplace. Clearly, the social fabric of a society is influenced by the performance of its young people. The author contends that it is essential to integrate knowledge about education and care for OVC in their early years of school, so as to promote their optimal development. The argument presented is that if the psychological, educational, and social experiences of OVC are not researched and supported through strategic interventions in the early years of school, then there is a strong possibility of further depletion of human resources and scarce skills. This contention is supported by the Global Campaign for Education, which identifies "early childhood care and education—especially for the most vulnerable and disadvantaged—as the first goal agreed on by 164 governments in Dakar in 2000. Pursuit of this goal will help individuals escape from poverty and fulfill their potential, to help combat inequality within and between communities and nations" (Muńoz 2012, 4). This should be one of the strategic priorities of African governments, a line of reasoning supported by research, demonstrating that early childhood is the period during which quality care and education programs can do the most to break the cycle of inequity that has dominated the lives of millions of children and families. However, this is ironic, considering that many African governments still do not prioritize, or often even include, early childhood in their education strategies or other national plans. Hence, this chapter begins by posing the question: Why should African governments invest in early childhood development and education?

African Investment in Early Childhood Development and Education

According to Education White Paper 5 on Early Childhood Education (Department of Education 2001, 1.3.1), early childhood development "refers to a comprehensive approach to policies and programmes for children from birth to nine years of age with the active participation of their parents and caregivers." The aim is to provide equal opportunities for all children to develop to their full capacity in the areas of physical, cognitive/mental, emotional, social, spiritual, and moral nurturing. Child development research has shown that most accelerated brain development occurs before children turn three years old, during which they "develop their abilities to think and speak, learn and reason and lay the foundation for their values and social behaviour as adults" (Department of Education 2001, 1.1.2). Over the last five decades, there has been general consensus among those studying child development that prenatal growth and early childhood experiences establish the foundation for long-term health and development of children into adulthood (Huston 2011). As Shonkoff (2010, 357) pointed out, "Interactions among genetic predispositions and early experiences affect the extent to which the foundations of learning, behavior, and both physical and mental health will be strong or weak."

There has been a proliferation of research publications indicating a significant correlation between poverty and its negative impact on early childhood development (Lee et al. 2006; Conger and Donnellan 2007; Crosby et al. 2010; Duncan et al. Kalil 2010). This is clearly visible in the lower educational achievements, health problems, and low positive social behavior of children from lower-income families (Halle et al. 2009). The Department of Education (2001, 12) stated that "children raised in poor families are most at risk of infant death, low birth weight, stunted growth, poor adjustment to school, increased repetition and school dropout." Furthermore, Hall et al. (2012) noted that children have less chance of being enrolled in school if they come from homes with limited economic resources, if their parents have low education levels, or if they are single or double orphans. Research has indicated that the cognitive development of more than 200 million children in developing countries under the age of five has been negatively affected by poverty, poor health, and undernutrition (Grantham-McGregor et al. 2007). In developing countries, nearly one billion children are deprived of one or more of the following: "drinking

water, sanitation, nutrition, health, shelter, education, or information" (Delamonica and Minujin 2007, 362). Studies have pointed out that the children from low-income families are more exposed to hazardous social and physical environments (Bradley and Corwyn 2002; Evans and English 2002; Benveniste et al. 2003; Bornstein and Bradley 2003), and as such, they are "exposed to more turmoil, violence, separation from their families, instability, and chaotic households" (Evans 2004, 77).

The situation in South Africa alone is alarming, since research has indicated that one-fifth of children are single orphans, two-thirds of whom live on less than R575 per month, over one-third of whom have at least one unemployed adult in the family, and over two million of whom live in poor housing (Meintjies et al. 2010). Taking into consideration these factors, it is not surprising that the average third-grade students scored 35 percent in literacy and 28 percent in numeracy (Department of Education 2012).

The problem with early childhood education and care of poor quality is that it sets the foundation for what happens in the child's adult life as well. In their review of several studies, Holzer et al. (2007) found that poor children experienced greater difficulties in school, and as adults, were less successful in the labor market, had more health problems, were more prone to committing crime, and displayed more socially unacceptable behaviors than their more wealthy counterparts. Other studies found that early environmental deprivation had a negative impact on adult cognitive and noncognitive skills (Knudsen et al. 2006), as well as adult physical and mental health (Barker et al. 2002; Danese et al. 2007). In their study, Duncan Ziol-Guest, and Kalil (2010) found that early economic deprivation of children negatively affected their earnings and work hours as adults.

The discussions, thus far, have indicated explicitly that early childhood education is critical to the positive development of children, supported by research on early childhood education programs that poignantly claim successes in child development. For example, Karoly, Kilburn, and Cannon (2005) found improvements in school achievement and social behavior, as a result of the Perry Preschool Project and the North Carolina Abecedarian Program, which they claimed continued into adulthood. The Early Head Start program in the United States noted an increase in the language and literacy skills, especially among three-year-olds skills (Love et al. 2005). Similarly, the Sure Start community-based program in the United Kingdom identified more positive social behavior and independence in three-year-old children, while their parents displayed more positive parenting styles and provided more stimulating home environments (Melhuish et al. 2008).

Based on the discussions presented here, the author believes that there are compelling arguments for governments, especially in developing countries, to invest in early childhood development. The first argument relates to the commitment to advance children's rights (Pillay 2014a). Most countries have endorsed the Convention on Children's Rights, and most African states ventured further by signing the African Charter on the Rights and Welfare of Children. These actions promote the need for early childhood interventions, especially for orphans and vulnerable children. Second, research cogently points out that the first seven years of a child's life are characterized by accelerated physical, intellectual, emotional, social, and moral development. For instance, by two and half years, 50 percent of a child's brain reaches its adult weight, and by age five, it reaches 90 percent (Department of Education 2001). This implies that if the conditions under which children are raised and nurtured are not favorable or are physically abusive while they are still young, there is a risk of stunted physical growth and irreversible brain damage, respectively. In South Africa alone, this would be the case for 40 percent of its children (Department of Education 2001). Third, there are strong economic arguments. For example, children becoming more productive and better earners as adults should increase living standards; with less funding needed for learning support and rehabilitation services; and, for women, better economic opportunities. One would expect that these positive developments, in turn, would lead to stronger social and economic growth of local communities and nations at large (Department of Education 2001). Fourth, early childhood intervention is likely to address social and economic disparities, as well as race and gender inequalities, which persist in society, thus assisting in breaking the "intergenerational cycles of poverty, disease, violence and discrimination" that exist in society (Department of Education 2001, 1.2.3.4). Fifth, a country is only as good as its people, so to compete in the global economy, the country has to invest in human development from birth. Finally, democratic societies do well by transmitting espoused values to their citizens from their early years of development. The above arguments provide answers to the initial question raised by the author on why African governments should invest in early childhood development and education.

Theoretical Perspectives

Which theoretical perspectives are pertinent for conceptualizing education outcomes for development and equality, especially for OVC? This is another crucial question, which needs to be asked within the African con-

text. First, in answering it, inclusive education needs to be conceptualized. According to the Department of Education (2001), the main tenets of inclusion are the following: all children are capable of learning and need support; education structures and systems should serve the needs of all learners; there should be a respect for differences in learners, based on age, gender, language, culture, disability, and HIV and other diseases; and both formal and informal learning should be acknowledged. One may argue that all these tenets are crucial for the education and development of orphans and vulnerable children, so socioeconomic status should be added to the list mentioned here. Furthermore, the policy of inclusion should consider children holistically (Engelbrecht 2004; Du Toit and Forlin 2009; Daniels 2010). As such, Bronfenbrenner's (1986) bioecological systems model would be a second appropriate theoretical framework to consider for the development and equality of OVC. Children should be viewed as individuals, functioning in various systems, such as the family, school, and community. All these systems are mutually influential; for example, poverty experienced by OVC at the personal or individual level is most likely to affect their family lives, school performance, and community interaction. Together with the policy of inclusion and the bioecological systems model, the context of OVC should be considered within a social justice theoretical framework. This framework endorses children's rights and strongly augments fair and equal opportunities for all children to reach their full potential in life. A social justice framework implicitly demands a paradigm shift from a needs-based approach to a rights-based one, as far as children are concerned. Adopting a bioecological systems model, the author next discusses research findings related to the multilevel experiences of OVC.

Educational, Psychological, and Social Experiences of OVC

Here, I address the question: What are the educational, psychological, and social experiences of OVC? Believing that it is essential to explore these experiences in order to secure best outcomes for equality and improved living standards for OVC living in Africa, the author presents research findings on orphans and vulnerable children that he has conducted in the last six years and integrates these with the findings of other researchers. Aligned to Bronfenbrenner's bioecological systems theory (Bronfenbrenner

1986), the author presents the findings on a multiple-systems level. The contention is that no level can be viewed in isolation, since each level contributes to the holistic experiences of OVC.

Personal Level

The personal level is characterized by the psychological experiences and changing roles of OVC.

Psychological Experiences

Pillay (2011) found that OVC experience strong feelings of sadness and anger because of their disadvantaged environmental conditions. Not having parental or adult guidance often leaves them feeling helpless and hopeless, especially when they do not receive any psychological support to help them cope with the death of parents or caregivers (Sloth-Nielsen 2003; Pillay 2011). Since the deaths of parents and caregivers are often due to HIV/AIDS, orphans commonly have to deal with stigmatization (Beddy 2011), victimization, and intimidation. Anxiety, depression, and stress appear to be common among OVC (Donald and Clacherty 2005; Maqoko and Dreyer 2007). Furthermore, several researchers have noted low self-esteem in OVC (Le Roux 1994; Iwanisec 1996; Louw et al. 1998; Desmond et al. 2003). Studies have also found OVC to experience difficulty with social relationships and behavior (Cluver and Gardner 2007).

Changing Roles

OVC are further psychologically affected by the changing roles that they are forced to take up due to the loss of their parents or adult caregivers (Pillay 2011). Many of them are still in need of adult love and care, but now they have to act as parents to younger siblings. The situation with regard to girls appears to be more psychologically distressing, since patriarchal influences are strongly entrenched in African culture and tradition (Ewelukwa 2005; Leatham 2005; Ejoyi and Ayo-Odongo 2006; Kiguwa 2008; Shefer et al. 2010; Visser and Moleko 2012).

Home/Family Level

Substantial studies have pointed out that OVC live in families that experience severe forms of poverty (Engelbrecht 2004; Engelbrecht et al. 2005; Daniels 2010). The study by Pillay (2011) provided descriptive data on

the living circumstances of OVC, with most living in houses that had broken windows, doors, and roofs, thus threatening their safety from inclement weather and criminals. It is normal for them to sleep on the floor with a single blanket, since furniture, such as beds, tables, and desks for doing their schoolwork, were actually luxuries in their impoverished context. OVC mostly live in overcrowded homes, which are unhygienic due to the lack of proper sanitation and bathing facilities. Children often share communal toilets, rendering them vulnerable to child predators.

Overcrowding is a common problem experienced in child-headed households. Despite the negative effects of poverty noted in the preceding discussion, it is important to point out that some studies do not automatically equate poverty with school failure (Au 1993; Buckner et al. 2003; Luthar 2003; Ungar 2004).

School Level

Pillay (2011) found that the main concerns, which OVC expressed about their schools, centered around their relationships with other learners and their teachers. The majority of the OVC pointed out that they were often mocked and picked on by other learners because of their poor socioeconomic circumstances. For example, they could only wash their school uniform on the weekends. Since they only possessed one uniform. Often they went to school without bathing, since it was a tedious and time-consuming task in the morning to boil water on a fire, if they did not have electricity. As such, many of them had body odor, which resulted in their being mocked and isolated by children who came from better socioeconomic environments (Pillay and Nesengani 2006).

OVC noted that some teachers did not understand the socioeconomic conditions in which the students lived (Pillay and Nesengani 2006; Taggart 2007; Taggart and Pillay 2011). Often teachers expected them to complete homework when they did not have space or desks. Some could not do their homework after dark, because they did not have electricity or money to purchase candles. Some teachers do not recognize the plight of OVC and unfairly compare them to children who have better resources. This reaction from teachers often discourages OVC from succeeding in school (Masitsa 2008).

However, it is imperative to note that many OVC also reported positive experiences with some teachers, especially guidance and life-orientation teachers (Pillay 2011). These teachers went out of their way to be extremely

kind and considerate to OVC, for example, organizing distribution of food baskets and school uniforms, and arranging extra learning support classes for OVC who struggled with their schoolwork. Such positive attitudes of teachers are most likely to contribute to the cognitive, behavioral, and emotional empowerment of OVC (Bennell 2005; Lethale and Pillay 2013).

Academic Achievement

As noted, poverty has a negative impact on the mental and physical well-being of OVC (Vaughn et al. 2000), which is most likely to have deleterious effects on their academic performance (Nesengani 2005). This was confirmed by Pillay and Nesengani (2006), who found that many OVC experienced difficulty with academic achievement due to poor concentration and their inability to complete school tasks. Many did not have sufficient time to complete their homework because of household chores and caring for younger siblings, a problem commonly reported by girls. Many OVC could not concentrate, because they did not have sufficient food to eat on a daily basis (Mogotlane et al. 2010), and some only went to school to receive the meal provided. The academic achievement of OVC was also negatively affected by their absenteeism from school, often due to not completing their schoolwork or resorting to begging on the streets each day (Pillay 2012).

Community Level

While some OVC reported that they received support from their local communities in terms of food and clothes, an overwhelming majority portrayed a negative image of their respective communities (Pillay 2012). This was largely due to concerns about safety, violence, and crime. Many girls reported that they were sexually violated by men in their communities (Phasha 2008), some having to offer men sexual favors for so-called protection from other men. Violence and crime in the community were common social problems, mostly due to poverty and substance abuse (Govender and Killian 2001). Often, OVC were the easiest targets because they had no adult protection.

Discussion

In South Africa alone, it is estimated that 10 million children fall within the birth-to-nine-year range (Department of Education 2001). The problem with this figure is that 40 percent of families in the country live in

gross poverty, with rural families being the worst affected. The literature reviewed above bears testimony to claims that children raised in poor families are "at risk of infant death, low birth-weight, stunted growth, poor adjustment to school, increased repetition and school dropout" (Department of Education 2001). Many studies (Leventhal and Brooks-Gunn 2000) on child development have correlated poverty with low cognitive, emotional, behavioral, social, and moral development in children. Some have also highlighted psychological difficulties in children, as a result of impoverished environments (Pillay and Nesengani 2006). More disconcerting is the evidence provided by several researchers that most of the problems that children face in their early lives affect them in adolescence and later in adult life (Duncan et al. 2010). For example, it has been noted that children raised in poor families become poor in adulthood. Many girls raised in poor families also end up having underweight and unhealthy babies, so the vicious cycle of poverty is perpetuated across generations.

Taking into consideration what has been presented here, the author contends that it makes sense for the government to invest in the early development of children. Several research findings have provided substantial evidence to indicate the benefits of early childhood intervention programs (Winsler et al. 2008). The aforementioned Head Start Program in the United States and the Sure Start Program in the United Kingdom have been deliberate attempts by the respective governments of these developed countries to give children a better start for a successful life by providing equal opportunities for all children (Currie and Thomas 2000; Gilliam and Zigler 2004). This is all the more reason why governments of developing countries should rise to the occasion and follow suit. Poverty is highly prevalent in developing countries, so the problems experienced by children in their early years of life are expected to be more intensive and extensive.

Thus far, in this discussion, much has been said about the importance of early childhood development for all children, generally. However, now the author argues that OVC are in a worse situation by virtue of not having parents or adult caregivers, living in extreme poverty, and being exposed to various forms of vulnerabilities, exploitation, victimization, and intimidation. The studies conducted by the author, together with the findings of other researchers, provide a vivid description of the psychological, educational, social, and economic challenges OVC confront on a daily basis. Adopting a bioecological systems theoretical perspective, the author

explored the experiences of OVC from multiple levels, namely, personal, family, school, and community. This provided a holistic picture of OVC, revealing their sadness, anger, depression, and anxiety emanating from their poor socioeconomic circumstances, which cut across the four levels mentioned. Their psychological difficulties, coupled with their family problems contributed to their academic difficulties at school. Also, community concerns, such as violence, crime, and substance abuse, had a direct negative impact on personal and family safety and security of OVC. Hence, none of the four levels mentioned are mutually exclusive, but all influence and are influenced by each other.

Furthermore, the author argues that the early childhood development of OVC must be contemplated according to an inclusive philosophy, which promotes a social justice framework that endorses their rights as children. A social justice framework focuses not simply on the needs of children but more on their rights to have such needs met (Shriberg et al. 2011; Pillay 2014b). In this regard, the author believes that governments, African ones in particular, have a crucial role to play. This leads to the last of the questions posed in this chapter: What are the crucial aspects of governance needed in Africa to improve equality outcomes for OVC?

Research has shown that investment in early childhood development is actually an investment in the economic future of a country (Conger and Donnellan 2007). Children who have equal opportunities early in life tend to be more productive and have better life satisfaction as adults. As such, African states should view an investment in early childhood development as a crucial aspect of governance. Since OVC comprise a significant percentage of the population in African countries, it will be essential for African states to give particular attention to their plight. In many instances, they will be among the future leadership of such states.

The author postulates that the crucial aspects of governance in African states would depend on policy initiatives directed at improving the early lives of all children. A study by Schütz, Ursprung, and Woessmann (2005) found that education policies that promote comprehensive school systems and early childhood education increase the equality of educational opportunity for children from diverse backgrounds. Several other authors have also indicated the importance of early childhood education in providing equal educational opportunities for children (Garces et al. 2002; Magnuson et al. 2004; Schweinhart et al. 2005). Hence, the author supports the view that education policies in African countries should comprehensively support early childhood education. Inevitably, this would increase the possibility of providing equal educational opportunities for OVC.

South Africa is one example in sub-Saharan Africa that has taken the lead in developing policies on improving early childhood development, even though some may argue that the good policies fall short in terms of implementation. For example, the democratic South African government has introduced policies that established a national system of reception year provision for five-year-olds, established funding proposals to make this a reality in poor and rural communities, and introduced intersectoral programs for children from birth to four years (Department of Education 2001). This is evident in the no-fees school admission policies for poor families and communities and supplemented by policies that make it possible for free health services for pregnant mothers and their children living in poor circumstances. The author contends that it will be a positive step for other African states to adopt such policies for OVC.

However, there are particular aspects that the author would single out for further policy development, based on his findings. These include the better management of social grants to ensure that OVC actually receive the funds; the safety and security of OVC; access to counseling services at schools and local communities; aftercare support centers, school homework support programs; learning support for OVC; better housing facilities for OVC; improved health services; better training and support for teachers working with OVC; and special policies to promote the well-being of orphaned and vulnerable girls who are targets for sexual abuse and exploitation, as revealed in this chapter. However, addressing OVC concerns requires systemic intervention, so policies directed at improving the lives of poor families should also be promulgated, such as earning supplements directed at correcting wage inadequacies, tax policies that do not penalize the poor, and job creation policies (Huston 2011). An integrated coordinated strategy that involves the different sectors of government together with relevant stakeholders in the community is needed for policies pertaining to OVC to be developed and successfully implemented.

Conclusion

The scope of this chapter was limited to the education, inclusion, and development of orphans and vulnerable children, with the intention of shedding light on the educational, psychological, and social experiences of this group. The main aim was to express the need for deliberate government intervention to improve the early childhood development of OVC. Since there are almost a billion OVC worldwide who fall within the

early childhood range, most in Africa, it is imperative for governments to take full responsibility for improving the quality of education in the early years of childhood. African governments, in particular, should not only focus on what children need to grow and succeed in life, but should actually see it as the government's responsibility to fulfill the rights of children. In the long term, improving the quality of early childhood education and the inclusion of OVC in this endeavor is bound to be a strategic investment in future human capital, especially in developing countries.

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CHAPTER 9

The Impracticalities of Pragmatic Education: The Disconnect Between Top-Down Human Capital Building Policies and Processes of Schooling

Jennifer Riggan

Introduction

In 2003, Eritrea introduced a comprehensive educational policy reform, in which the government mandated that education should be more "pragmatic." "Pragmatic" education was shorthand for human capital development and presented as a contrast to what was often critiqued as the outdated method of "theoretical" education. On the ground, in Eritrean classrooms and schools, as in other places, curricular reforms oriented toward developing human capital often functioned quite differently from the ways in which their architects intended, and yet, this on-the-ground perspective is seldom analyzed. Policy reforms, in general, and human capital reforms, in particular, often focus on somewhat utopian ideals of what schools should be doing, rather than an awareness of what teachers

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actually are doing to respond to problems in the context of resource inadequacy and the particular capacity of schools and teachers. This chapter uses the case of Eritrea to illustrate the disconnect between policymakers' visions of education for human capital development and the pragmatics of actually educating students in often underfunded, under-resourced African schools, in order to argue for human capital building programs that emerge from grassroots teacher expertise and respond to the exigencies of local communities, local economies, and local schools. Specifically, I will argue for attending to teacher expertise in these schools in order to better implement and design these kinds of reforms.

At the time of my fieldwork, schools in Eritrea lacked many of the most basic resources, including the more extensive resources necessary to teach pragmatic or job-oriented subjects. Although much attention has been paid to resource scarcity in schools in Africa and elsewhere (Samoff 1999), my purpose here is to highlight not scarcity, but the resourcefulness, resiliency, creativity, and knowledge that have allowed teachers to ensure that students learn under challenging circumstances. Teachers' knowledge of how to adapt to difficult circumstances often clashes with the goals of top-down policy reforms. Furthermore, as teachers attempt to navigate new policy terrains and call officials' attention to the practical challenges with implementing new policies, their concerns are often dismissed as evidence of teacher "backwardness."

Based on ethnographic research on the implementation of the 2003 policies, this chapter explores a disconnect between policymakers' assumptions about human capital development and the implementation of these policies in schools. To be effective, all educational policy requires an ability to align goals, vision, and ideals of what the education system should be doing within the realities of resource scarcity. Reforms oriented toward building human capital are even more complex, because they require an additional alignment with understandings of the labor market—what jobs are available or are likely to become available. Here, I ultimately make a case for the importance, particularly at the secondary level, of implementing these reforms in a way that integrates and works with teacher knowledge, not only of how to best teach under conditions of resource scarcity, but also their thoughts about what the labor and career trajectories of students might be.

The chapter begins with a brief discussion of my research methodology, followed by an overview of Eritrea's 2003 policy reforms. I then introduce my theoretical framework, which first theorizes policy as a form of

"friction," in which multiple elements, in tension with each other, produce varied results (Tsing 2005; Vavrus and Bartlett 2009). To gain better insight into the role of teachers' expertise in the friction of policymaking, I draw on James Scott's (1998) notion of different forms of knowledge—outside expert knowledge (*techne*) vs. embodied or localized knowledge (*metis*). I use this framework as a lens through which to analyze my ethnographic data. Findings are presented in several subsections, two of which detail the two competing discourses on "pragmatic" education—that of policymakers who asserted that the policy reforms were pragmatic, and that of teachers who asserted that the new policies were utterly impractical. To illustrate my discussion of these two discourses, I also include a description of what the curricular reforms actually looked like in the classroom. I then conclude, by returning to my theoretical framework, to analyze the disconnect between both discourses on the policy and between the policy and the lived classroom experience, to argue that teachers have a particular kind of expertise that often gets ignored in policy reforms and, perhaps, should be considered.

Methodology

Data for this paper was taken from a two-year, interpretive, iterative, exploratory, ethnographic study of teachers in a junior and senior secondary school in one Eritrean town. Data consisted of hundreds of hours of classroom observations and observations of teacher and administrator trainings, in-depth interviews with 30 teachers, interviews with administrators and policymakers, and a review of policy documents and curriculum. The focus of the study was the role of teachers in nation-building. All field notes were typed, interviews were transcribed, and all data were coded, using a grounded theory approach, which emphasized the identification of emic concepts and concerns of research subjects. Initially, curriculum reform was not conceptualized as a central component of the study, but the iterative design of the study revealed that teachers engaged the new curricula on a daily basis, were deeply concerned about and impacted by the curriculum reforms, and often talked about them during interviews. Classroom observations revealed teachers' struggles with resource scarcity and new curricula, which were prescribed for them without adequate resources and training. By triangulating between and comparing different data sources, I found that there was a distinct policy discourse, which asserted that teachers needed to be weaned from teaching

in a teacher-centered manner that was deemed archaic and backward and from a teacher discourse that asserted that policymakers lacked familiarity with the material challenges facing schools, and therefore, had designed an impractical policy. While the policy discourse sought to differentiate the material circumstances of teaching from the prescribed pedagogy, teacher discourse insisted that their pedagogy—teacher-centered, as it might be—was pragmatic under the circumstances. Thus, what emerged were two competing discourses of pragmatism.

Theoretical Framework: Teacher Knowledge and Policy Expertise in Human Capital Reforms

Although Eritrea is unique in some respects, the wide gulf between policymakers' vision of human capital development and the realities of schools is far from unique to Eritrea. Assemblages of national-level ministries and international organizations tend to converge around a particular vision of what education should be, something that Frances Vavrus and Leslie Bartlett (2009) refer to as the "Inter/National" System and that other scholars have written about as well (Popkewitz 2000; Anderson-Levitt 2003). Learner-centered pedagogies have become an increasingly popular component of this inter/national vision in sub-Saharan Africa and, indeed, around the globe. There is a conventional wisdom that learner-centered pedagogies constitute "good" education, and conversely, that non-learner-centered methods are "bad" education. And yet, at the level of implementation, there is far less consensus around these pedagogies, as noted by Vavrus and Bartlett (2013). Michele Schweisfurth (2011) noted multiple challenges with implementing learner-centered policies and pedagogies, including material and human resources and cultural misfits, regarding understandings of teacher–student relationships and relations of authority and power. Schweisfurth also noted the disconnect between expectations that learner-centered pedagogies placed on teachers and the expectations placed on teachers by high-stakes examinations in the same education system. In the sections that follow, I emphasize how teachers articulated these disconnects and understood the need to balance the mandate that they utilize learner-centered pedagogies with their own knowledge about conditions in the schools and student learning under these conditions. Below, I outline some theoretical frameworks that help us to understand teachers' engagement with policy.

Vavrus and Bartlett's (2009, 42) work on vertical case studies considers policy implementation as a sort of *bricolage* of local expertise and beliefs, integrated with an assemblage of international and national actors, institutions and beliefs, assumption and research about good education, and, in the case of human capital development, ideas about what kind of educated subjects make a strong economy and society. Drawing on Anna Tsing's (2005, 6) notion of globalization as "friction," Vavrus and Bartlett (2009) argued that policies are never seamlessly implemented but are always the result of clashes and tensions that constantly rub against each other, not impeding movement, but slowing it down and making it less efficient (see, also, Vavrus and Bartlett [2013]). In my analysis of teachers' attempts at engagement with these new policies, friction was certainly present, but there was also an attempt among teachers to keep things moving forward by reconciling and integrating very different forms of knowledge. In so doing, they cast themselves, rather than policymakers, researchers, and international consultants, as the experts on what was good for schools.

In order to better understand teachers' positioning of themselves as holding expert knowledge amid this *bricolage* of international, national, and local ideals about education, James Scott's thinking about modernization and forms of knowledge that mediate modernist reforms is useful. Scott (1998, 89) argued that states implement projects founded on "scientific" or "rational" notions of what is "modern," often in highly authoritarian ways. He suggests that village resettlement, city planning, and agricultural reforms are all examples of such "high modernist projects." Following Scott's arguments about the arbitrary nature of these "high modernist" state projects, I would suggest that educational policy reforms, in general, and Eritrea's move toward learner-centeredness are also high modernist projects. Scott (1998) argued that these types of projects fail, because they are founded on a generalized, oversimplified, and static notion of what they are—in reality, they are complex social or environmental processes. In short, they fail because they are not pragmatic on the ground. Teachers made similar arguments that the imposition of learner-centered pedagogies failed to consider the actual complexity of schools and the expertise of those (teachers) who understood schools. Scott then contrasts forms of "expert" knowledge, or *techne,* on which high modernist state policies and projects are based, with *metis*, a form of knowledge that is dynamic, highly localized, and responsive to changing conditions. According to Scott, "*metis* represents a wide array of practical skills and acquired intelligence in responding to a constantly changing natural and

human environment" (Scott 1998, 313). Arguably, teachers drew on what Scott would call *metis*, or local expertise, in their critique of learner-centered pedagogies and other elements of Eritrea's human capital reform.

Contextualizing Eritrea's 2003 Curriculum Reform

Funded by a variety of international governmental and nongovernmental organizations, the move towards pragmatic education in Eritrea was designed to improve the quality of human capital in two ways. First, the curriculum was expanded in order to include several subjects that were deemed "job-oriented," including information technology (IT), home economics, health education, and a variety of other subjects. Second, teachers were instructed to teach students using an array of learner-centered teaching techniques, including debates, discussions, experiments, role-playing, and field trips. The vocational emphasis of the new subjects combined with the emphasis on learner-centeredness was seen as "pragmatic," because it would produce not only knowledgeable students, but learners who would be prepared for the twenty-first century world of work, with useful skills, the capacity for critical thinking, and the knowledge of how to learn. The third component of the reforms was to "avoid wastage," which means to ensure that students complete each level of education (junior secondary or grade eight for all, and senior secondary for those who passed the eighth-grade exam to enter high school). This component was particularly controversial, because it resulted in all senior secondary students being sent to Sawa, the site of Eritrea's military training center, to complete high school. The merger of education with military training was seen as highly problematic, because it was perceived as transforming the education system into a conduit for what has become permanent conscription into the military. I have discussed this extensively elsewhere but will be focusing here on other elements of the reforms (Riggan 2009, 2016).

Job skill-oriented course offerings and learner-centered pedagogies were deemed "practical," because they were viewed as making students, and therefore, the nation, more economically productive. According to the new policies, students were to acquire job skills through the addition of vocationally oriented subjects, such as health science and information technology. Also, previously "academic" content was simplified to help students better master course content. Finally, teachers were pressured to teach in more learner-centered ways to instill creativity and critical thinking

skills in students. What was commonly referred to as the "new curriculum" and as "practical" education was a reference to all three components of the reforms, as articulated in the following interview with a Ministry of Education employee involved in the curricular reforms[1]:

> The main change is that there are two big points to stress here. One, in our previous study in 1997, it was found that [for] most of the secondary school subjects … that the textbooks were full of knowledge and facts, and theoretical facts only, and a lot of the papers were beyond the cognitive level of the students. So, they needed some kind of simplification … and a lot of condensing [of] the portions…. Every subject was taught for eight semesters … and they were found to be beyond the age level of the students. We had a discussion about these points on the one hand. On the other hand, the introduction of the vocational courses needed some space in the new curriculum, so the proposal stresses how to streamline the subject and leave space for the introduction of some vocational courses…. There is not much difference except that the main aim now is that a child who has graduated from secondary level should have a chance to go to higher education or should get the chance to switch into some kind of vocational track. So, it has switched from academic to a combination of academic and vocational. So, this is the main objective that we have changed—to incorporate these vocational objectives. Now, the effect of all the courses at senior secondary school level should have an impact on the child—to develop skills that will help them in their life. They should get some kind of skills—practical skills, business skills, technology skills, etc.

Overall, this Ministry of Education official summarizes an approach designed to make education more accessible to a larger number of students, specifically, by streamlining the curriculum, matching the level of education more "appropriately" to students' levels, and adding vocational courses. In short, he argued, the curriculum had traditionally been too "academic" and needed to be scaled back to become more practical, both in terms of its accessibility to students and through the addition of vocational training.

The introduction of learner-centered pedagogies represented a distinct departure from previous ways of teaching in Eritrea, indicating a vision for a differently skilled student, who could think independently, be creative and learn to learn:

[1] In the interest of protecting human subjects, names and identifying information of all interviewees have been omitted.

> A learner-centered and interactive pedagogy is central to the new national curriculum we are developing. This approach demands a high level of learner participation in the construction and delivery of knowledge. An essential element in this process is the need for teachers to encourage students to investigate and pose questions, to develop creative and independent thinking, and to shape their problem-solving and communication skills. The fundamental objective of this process is to promote learning with understanding. This is more than memorizing information. It involves understanding the significance of information, so it can be used as a tool to solve problems in the future. When students learn with understanding they are developing their abilities to think, solve problems, and become independent learners. (Ministry of Education 2002a)

Learner-centered or interactive pedagogies were seen as a key mechanism through which education was to become more accessible to the students and to provide them with many of the skills they would need to promote the development of Eritrea (Ministry of Education 2002a, b). Furthermore, according to the rhetoric of the reform, as well as analyses of these curricular trends throughout the developing world, these pedagogical and curricular shifts would transform students into types of "knowledge" workers thought to benefit the global economy. A 2003 World Bank report on Eritrea's educational reforms emphasized this rhetoric to suggest that the primary purpose of this more "practical" education is to create workers: "The new curriculum is intended to prepare learners better for the world of work through a steady introduction of practical skills that starts with a practical orientation at the elementary level, introduction of prevocational skills in middle school and integration of practical subjects in high school" (World Bank 2003, 6).

The emphasis on "practical" education, learner-centered pedagogies, and the creation of an economically productive worker is clearly oriented toward a particular vision of developing human capital. Human capital theories have long argued that development requires skilled manpower and that schools' main purpose should be to train citizens in specific ways so as to economically develop the nation (Fägerlind and Saha 1983; Inkeles and Smith 1974). Indeed, Eritrea's educational policies have arguably always had human capital concerns at their core. One of Eritrea's main goals, since the time of the struggle for liberation was "the transmission of skills that can be used to solve practical problems" (Gottesman 1998, 133). The 2003 policies modified this goal by incorporating the

need to utilize education, not only to develop an economy but to become "globally competitive" (Ministry of Education 2002a, b).

This linkage of educational policies with the goal of making the national economy globally competitive is reflective of changes in thinking about what type of educated, economically productive citizens should be developed. Scholars argue that as economies have shifted from Fordist (industrial) to post-Fordist (informational) education systems, they must also change their goals and practices to meet the demands for more flexible labor (Carnoy 1995, 2006; Morrow and Torres 2000). Policy trends, such as the move away from teacher-centered, knowledge-driven pedagogies and the move towards learner-centered or interactive pedagogies, respond to this need (Tabulawa 2003). Constructivist teaching methods, geared toward helping students build their own knowledge through interactive methods, are promoted as a tool to help students to be flexible and self-motivated learners. This recasts teachers as learning facilitators responsible for creating situations in which students can learn (Muller 1998; Tabulawa 2003). The shift from teacher-centered to learner-centered pedagogies, thus, is clearly linked to developing a particular type of human capital; however, the complexity of teachers' roles in producing these new workers is seldom considered. Policy reform tends to treat teachers as if they can simply be reprogrammed to accommodate the new dispensation, rather than as human beings with beliefs about what good education is and with expertise to implement these beliefs, both of which are the product of a long trajectory of institutional and professional socialization and training.

Findings

The following section seeks to illuminate two different discourses on Eritrea's 2003 curricular reform, and particularly, its mandate that education be more practical, or vocationally oriented. As I have discussed here, learner-centeredness was a central component of both the new policy and of the critique of it. Thus, much discourse on the policy centered around whether learner-centeredness was practical or impractical, although there were other components of the reform as well, and discussion of these was embedded in discussions of learner-centeredness. This part of the chapter is organized as follows. The first section details the discourse of policymakers, which drew on international curriculum trainers' advocacy and training around learner-centered pedagogy, emphasizing the need to stop teachers from teaching in a manner deemed "backward." The next section

illustrates what the curriculum reform looked like in schools, emphasizing the creative ways in which teachers contended with the lack of resources and with the disorganized implementation of the new curriculum. The final section details teacher discourse regarding the impracticality of the new curriculum, emphasizing the ways in which teachers cast themselves, not curriculum writers, policymakers or international trainers, as the experts on what was pragmatic in schools.

The Discourse of the Practical: Promoting Learner-Centeredness as the "Right" Way to Teach

Methods that teachers had traditionally used, in which they were trained in and through which they themselves had been taught, were described as "didactic" and "teacher-centered," and were increasingly criticized by proponents of the new curriculum as "frontal and "archaic." Furthermore, teachers were criticized as being not only outdated and lacking in expertise and training in the "new" methods but also lacking in the desire to improve themselves professionally. As one Ministry of Education curriculum writer noted:

> There are some … disadvantages of our previous curriculum and education system. First of all, it was an archaic methodology, and it was a teacher-oriented approach—teacher-centered. So, we have to look for the best practice of participatory learning, and it has to go also to the curriculum that we are trying to make. (Interview, Ministry of Education, Curriculum Department)

The Ministry of Education document quoted previously and the quotation here are unequivocal in their assertion that there is something wrong with teaching methods that rely on passive learning, memorization, and teacher-centered instruction. However, except for noting that lessons lack variety, these perspectives fail to explain why there was a problem with teacher-centered methods. In fact, although there were many references to a study conducted by the Ministry of Education in 1997, that study failed to empirically ground the rationale behind learner-centered or interactive pedagogy, and instead, simply asserted that the prevalence of teacher-centered methods were problematic.

Perhaps, even more significantly, teachers who were expected to implement these changes had no idea why it was important to do so, only that

the way they had always taught was now thought to be somehow backward. The reasons for the push to reform the education system by making it more learner-centered and interactive were seldom explained to teachers and were instead simply asserted as the better, or more "modern," way of teaching. In trainings that introduced the new curriculum to teachers, they were told it was "forbidden to lecture" as one teacher told me. The idea that the "old" ways of teaching—lecturing, giving notes, and providing information to students—were "bad" was hammered into teachers' heads, with little explanation of the reasons why, and no chance for teachers to explain their own teaching approaches.

Development organizations also took the approach of reprogramming educators and impressing upon teachers that teacher-centeredness was no longer the right way to teach. Next, I recount a training conducted jointly by the Ministry of Education and an international NGO, the goal of which was to explain the rationale for learner-centered and interactive pedagogies to school directors, who would then convey it to their teachers. The rationale for the use of interactive, learner-centered pedagogies was elaborated, somewhat, but ultimately, its inherent "rightness" was simply asserted. The Eritrean curriculum consultant to the Ministry of Education, who had conducted the 1997 study that resulted in the change in curriculum, and a consultant from an international NGO ran this training.

The training began with the Ministry of Education consultant reviewing the results of their study saying: "In our classroom observation, we found that most of the teaching was dominated by teachers." He emphasized that students should not wait for the teacher to learn, but that students should be responsible for their own learning. He then continued: "We assume that learning should be followed with understanding. There is a difference between memorization and learning with understanding. This involves understanding the significance of information as a tool to solve problems in the future. Interactive pedagogy requires that we discourage machine gun memorization. There are certain moments when memorization is good, but it should not be the main process." His speech assumed that student "understanding" did not and, in fact, could not be promoted in a teacher-centered class.

He went on to talk about the role that the teacher should play in order to bring about student understanding, "The teacher has a role to play but should not be dominant." He then cited statistics about how much time is dominated by the teacher in Eritrean classrooms. Implicit is the contention that students taught through teacher-centered methods spend all

their time memorizing and fail to comprehend what they are learning, but there is no real questioning of whether students process information or reflect on it beyond memorization. There was little willingness to explore what was and was not learned through teacher-centered approaches or how teacher-centered approaches were implicated in a complex set of social relations between teachers and students.

The NGO consultant then began to talk, similarly assuming that teacher-centered methods were incapable of creating good "learners." He spoke of the "beauty of lifelong learning" and the importance of "learning to love learning" saying, "Teachers have to know how to generate an environment where learners think. Giving and receiving information doesn't mean you learn. And information is not knowledge. Our wonderful brain tries to process information. The learner must integrate it to make sense of it. By expressing an explanation to others about what you learn, you learn more. That is the gift we have as teachers." He then put up a slide that read:

> "Focus on learning vs. focus on teaching"
> Learners' past experience is important
> Learners construct knowledge
> Learning should be sequenced to be manageable
> Hands on experience is important
> Class atmosphere should be friendly and democratic
> Learning cooperatively
> Learning owned by learners
> Teacher facilitates learning

These words not only labeled teachers' traditional ways of teaching as ineffective and ascribed beauty and inherent goodness to the "new" pedagogies, but also reduced what teachers had previously done in the classroom to simply "giving students information."

What was most striking about the ways in which "learner-centered" pedagogies were introduced was the lack of rationale given for this change in pedagogy. Proponents of the new curriculum argued that their approach was based on up-to-date research and would more effectively teach students to think; however, the cited research generally quantified the use of teacher-centered methods, but did not explore what, specifically, was detrimental or beneficial about other methods. No "research" conducted in Eritrea actually looked at whether students taught in teacher-centered classrooms emerged with the ability to reflect on the knowledge they had

been given. Teachers were, for the most part, simply told that learner-centered approaches were better, and it was made clear that there was something "wrong" with old ways of teaching. Trainers and curriculum developers never considered the possibility that extensive knowledge and experience underlay teacher-centered methods or that learner-centered methods were promoted simply on the basis of "experts" having declared them to be more effective. In contrast, teachers thought of themselves as experts about what would work in their own classrooms and were wary of reforms that did not take into consideration their classroom realities.

The Impracticalities of "Pragmatic Education:" An Illustration

Before moving into a discussion of teacher discourse on the new curriculum, it is important to have a sense of how the new curriculum actually played out in schools and classrooms. The following section illustrates some of the challenges teachers faced with implementing the new curriculum in classrooms, but also teachers' willingness to experiment with the new curriculum despite their critique of it.

In the vignette that follows, I describe an IT class I observed that was taught by a teacher I call Eyasu.[2] Eyasu was an extremely talented and well-educated math teacher. He had been teaching for over 10 years, gave clear lectures, worked with his students outside class, and possessed an expertise on mathematics befitting a graduate from the highly rigorous and competitive Addis Ababa University. His classes were challenging and many students failed, as they were expected to in high school, but he also offered extra help and believed he was doing his best to help students succeed. Because of changes in the curriculum that deemed that the subject was too hard for the students, and that too many of them were failing, math classes had been cut back in order to add several "practical" subjects, such as IT. This meant that Eyasu only had one math class and, in order to fill his teaching rotation, he was asked to teach IT. IT was one of several new "practical" subjects, which were to be taught as part of Eritrea's 2003 comprehensive curriculum reform. Later, in the semester, after the Ministry of Education received feedback from schools having difficulty implementing IT classes, they canceled IT, and most of the "new" practical classes. Eyasu was then transferred to a junior secondary school (which also did not need a math teacher), and then to a school in a remote desert

[2] All names are pseudonyms.

location. He refused to go to that school and eventually moved out of the public education system, ultimately leaving the country.

Eyasu's IT class illustrates the consequences of overriding, and neglecting, local teacher expertise about the physical condition of classrooms and how to navigate the lack of resources, in favor of policies that draw on ideals, ideologies, or research about what is effective but are external to the school context. On Eyasu's first day of class, he wheeled an overhead projector across bumpy pavement from the office to a classroom filled with approximately 70 students. This was one of the school's largest and best-equipped classrooms, which meant that it had windows that shut to keep out the dusty wind and working electrical sockets. The physics teacher came in to help Eyasu hang a sheet, which was being used as a makeshift screen, from the blackboard. In order to teach this class in this room, Eyasu had rearranged his schedule, combined the two sections of grade eleven, and moved them to a grade ten classroom.

Eyasu had little background in computers. Still, having minored in computers, his expertise surpassed that of all the other teachers. Just before class, teacher Eyasu was asking me how I managed to send and receive email in the remote town where we lived, given that there was, and still is, no Internet access in the entire town. Even with access to the Internet, the phone lines to the town were often down. I tried to explain that I had to connect my computer to the phone and make a long-distance phone call to the capital in order to connect to the Internet via one of the servers in Asmara. It took him a long time to grasp this concept.

In order to teach IT, Eyasu had been given a syllabus but no text and no materials. The school itself only had one computer, kept in the director's office, which was usually locked and seldom used. The first sentence of the syllabus stated that the goal of the IT course for grade eleven students was "to make productive citizens." Eyasu told me he was taking a course that would help him prepare for this class, and he had also joined the public library and took out their one book on computers.

Eyasu began the class by putting a slide on the projector. "In the beginning what were computers for? Who can define computer?" he asked the students.

No one answered. He told them what computers were used for, noting that when he was a student, they used typewriters to type exams and now they use computers. The slide on the projector provided a timeline of the evolution of computers going back to the late 1800s, to the calculating machine. He explained how computers have evolved and become smaller

and more efficient over time. This discussion of the history of computers took up more than a whole class period. He then changed the slide and lectured about different generations of computers.

Eyasu's case illuminates two ironies, both of which are illustrative of the problems that arise when implementing educational policies oriented toward developing human capital, without taking into consideration local realities and teacher expertise. First, in the effort to teach what was supposed to be a "practical" subject, he was forced into a traditional teaching method—lecture and abstract knowledge, due to lack of resources. Second, because of the realignment of education toward practical subjects and away from academic ones, this extremely talented and well-educated teacher was actually pushed out of teaching. A highly educated person is a scarce resource; however, "practical education," as implemented in Eritrea, led to squandering of this scarce resource rather than using him effectively, arguably a highly impractical outcome.

Despite concerns about the practicality of the new curriculum, and learner-centered pedagogies, in particular, it is notable that teachers, particularly the older, more experienced teachers, often tried to work with the new curriculum. Teachers' simultaneously critical and cooperative stances toward the curriculum were particularly well articulated by a group of English teachers who studiously avoided teaching from their textbooks, but did utilize a number of their own self-designed learner-centered activities.

The English teachers, more than teachers of any other subject, consistently deviated from their curriculum. Each of the four senior secondary school English teachers had decided separately not to use the curriculum or to use it only in a limited way. After conducting many observations of English classes, I noticed this trend among English teachers and suggested that we hold a focus group to discuss their philosophy of teaching. When I pushed them to come up with some explanation for why they persistently did not teach from the textbook, the most senior of the Eritrean teachers stated, "It's not like we are rebelling against the curriculum." Instead, he argued, the curriculum was ineffective and in order to be good teachers, they believed they had to make professional decisions that deviated from it. This reflected teachers' well considered understandings of what would "work" in the classroom.

Weak implementation of the new policies, combined with teachers' dislike of the English curriculum, played a large role in teachers' decisions to not use the curriculum. For the first year of the policy reforms, this lack of

clear direction as to what the English teachers should teach gave teachers the freedom to choose not to use the book. English teachers already felt that their curriculum was "impractical," meaning that needed resources were not always available, the subject matter was inaccessible to students, or the curriculum failed to capture student interest. Furthermore, the communicative style of teaching, which was promoted in the English curriculum, contradicted teachers' ideas that students needed to have the "basic knowledge" of grammar, sentence structure, and vocabulary before they could communicate.

The English teachers were a diverse group. In the junior secondary school, there were three Eritrean English teachers. In the senior secondary school, there were two Indian teachers, who were professionally trained as English teachers in India and had taught for many years there before coming to Eritrea, and two Eritrean English teachers, one younger, who had been teaching for only two years, and one more senior. Despite this diversity, I found that their reasons for not using the text were surprisingly similar. English teachers tended to believe that, without knowledge of grammar and grammar structures, students could not be taught how to communicate. Some expressed concern that Eritrea's communicative curriculum was in the "wrong order," and thus, inaccessible to students who needed to be taught a sequence of grammar forms, starting with parts of speech and moving to different types of sentences, and then, only after they had mastered each of the language's component parts, addressing more communicative activities, such as speaking or writing paragraphs. Teachers also complained that the curriculum was too difficult for students, and particularly, in the case of the grade ten and eleven curricula, it was disjointed and hard to follow.

Still, teachers did not entirely ignore the English curriculum and instead made selective use of it. Even more interesting was their improvisation in creating their own curriculum. English teacher improvisation resulted in a variety of different types of teaching, ranging from highly teacher-centered to highly learner-centered. At times, teachers taught the learner-centered lesson as written in the text, but made adaptations to it to transform it into a teacher-centered lesson. At other times, teachers improvised by visiting the library and finding old grammar texts to teach students rote, teacher-centered grammar lessons, by having them copy notes and exercises out of books. Teachers also used limited resources in their library and found other reading material in order to give students reading lessons. As much as possible, teachers tried to find reading material that the students could

"relate to." Finally, teachers created discussion questions and invented debate topics to promote conversational activities in which students could practice speaking skills. Often these questions came out of a library book, but also from teachers' own imaginations. As I have written about elsewhere, these debates and discussions (which also occurred in some history classes) provided a forum for politicized commentary on the part of the students (Riggan 2018). This was a unique opportunity for students to speak about the condition of the nation and, I believe, constituted a form of political socialization.

Other teachers also engaged in creative experiments with learner-centered pedagogies. There were examples of a physics teacher making use of a closet, the only dark space he could find, for his students to do an experiment that required darkness. In another example, a biology teacher took 44 students into a lab and, using three microscopes, tried to instruct students how to make slides of leaf cuttings. Teachers were eager to show that they were on board with this new, contemporary curriculum, but they were also critical, arguing that it was deeply impractical under these circumstances of resource scarcity.

The Discourse of the Impractical: Teacher Perspectives on Learner-Centered Pedagogies

Teachers' comments that the new curriculum and prescribed new teaching methods would not work in Eritrean schools reflected their understanding that there was a misfit between the expectations of these new policy mandates and the material realities of schools on one hand, and the culturally embedded relationship between teachers and students on the other. Learner-centered or interactive pedagogies required resources—materials, equipment, and time—that were often lacking in the schools. To conduct learner-centered activities in the social sciences required students to spend a good deal of time engaging in research in libraries that were often not open, or if open, were poorly stocked. In the natural sciences, learner-centered activities consisted of laboratory experiments for which materials and equipment were lacking. Learner-centered activities also took more class time than teacher-centered ones, and teachers generally worried about having enough time to get through all the required material in a semester.

Teachers who did implement learner-centered activities tended to be the more experienced teachers who had a good deal of confidence in their

ability to command students' respect. Even among these teachers, however, student motivation, student expectations, lack of resources, and class size were cited as the reasons why learner-centered pedagogy was impractical, as one teacher told me:

> Whatever the curriculum, the class size affects the effectiveness… Whether it is student-centered or teacher-centered, this affects the class. The number of students should be minimized. Besides this, the background of the students—their economic status—all this has an influence. In order for the curriculum to be effective, students should be motivated…. Regarding this new curriculum, my understanding is that the curriculum should be started from lower grades. We have been practicing this lecturing method, but students aren't habituated to this new method. So, the change is sudden, and the teacher sees the sudden change for the students. (Focus Group with Social Science Teachers; Iyob)

Despite the widespread beliefs that learner-centered pedagogies were impractical for Eritrean schools, as we have seen, there was a great deal of variation in teachers' responses to the learner-centered curriculum. Some teachers refused to attempt new methods, while others experimented with them and attempted to adapt them in their classrooms. Most found some combination of the two that was comfortable. And yet, despite attempts to adapt learner-centered pedagogies, teachers repeatedly discussed reasons why the new curriculum would not work.

In focus groups with students and interviews with teachers, I was told that gaining knowledge is the main purpose of education, but it became apparent that there were many understandings of what is "knowledge." Both students and teachers suggested that knowledge would make them better people, would teach them to know right from wrong, and would help them to improve their families. The idea that knowledge had a moral, as well as a practical or economic value, was a very different understanding of the meaning of "knowledge" that was embedded in a learner-centered approach.

Many teachers felt that new pedagogies were less effective than "traditional" methods, because they prevented teachers from disseminating a form of knowledge that teachers referred to as "basic knowledge." Teachers argued that there was a core of "basic knowledge," which they differentiated from applied knowledge, that all students should know and that the teachers' job was to make sure students mastered this knowledge. For teachers, "basic knowledge" not only provided the foundation for all other learning, but also contained a moral value. Teachers tended to

believe that the new curriculum and pedagogies would impede their ability to inculcate basic knowledge in students, as shown by the following teacher's critique of the focus on "practical" or "applied" knowledge:

> Basic knowledge means to go with the modern world. Many topics considered easy topics should be taken down to the lower grades. The main topics that are needed for the man—the knowledge about the clock, medical specificities, many things, these should be taught up to tenth grade, and then they can choose applied topics. Even the math students need biology. Even the biology students need the math. Grade eleven students can start the practical topics. But the basic knowledge for Eritrean senior secondary schools should be streamlined. It should be filtered. In ninth grade, they can learn some topics, and in tenth grade, they should learn some topics. In early grades, they should learn many modern topics. (Interview, Vijay)

The concept of "basic knowledge" suggested that the primary goal of schooling was, first, to ensure that all students have a common base of learning that they know that will make them educated, and second, that only after they have that knowledge will they be able to learn practical "skills." The above quotation from the interview with Vijay, one of the Indian teachers, relied on the structure of the Indian education system to argue that, contrary to what policymakers in Eritrea promoted, young students up to grade ten should be taught "basic knowledge" to make them "modern," while older students, having mastered basic knowledge, can then learn practical skills. Education, Vijay suggested, had a dual purpose—to make students "modern" through the teaching of basic knowledge, and then later, to make them economically productive by teaching practical or applied skills. Vijay argued for covering a core of academic "basics," and only then, moving on to "practical education."

Accompanying this idea of basic knowledge, there was also a general sense that the process of disseminating knowledge to the students should follow a basic, preset sequence. The teaching of English was the most significantly altered by the mandate to teach in learner-centered ways, a process that began long before the reforms. As a result, English teachers were constantly complaining that their curriculum was "not in the right order." The "right" order would have meant to move sequentially from simple to complex grammar points and lastly, teach skills such as reading, writing, and speaking. In contrast, the new curriculum merged the teaching of skills with the teaching of grammar in ways that, as many English teachers argued, their students found incomprehensible. Math teachers reflected similar ideas about there being a proper sequence in which math

should be taught. And social science teachers at various levels often talked about what the students at different levels were capable of, usually deciding that the younger students were not yet capable of the abstract thought necessary to hold a discussions or debate about the material.

Teachers, particularly senior secondary school teachers, were also wary of the simplicity of the new curriculum, feeling that it failed to prepare the top students for leadership roles. The general feeling was that if the curriculum was not rigorous and students were not challenged that they would not be globally competitive. This was ironic, considering that one of the goals of the new curriculum was to make students globally competitive, a fact reflected in the contrasting views held by teachers and policymakers, respectively, about what would make Eritrean students "globally competitive"—rigorous teaching of "basic knowledge," or creating students who knew how to learn and were endowed with "practical skills."

Teachers also complained that they were not consulted before the new curriculum was implemented, which further contributed to their belief that the new curriculum did not meet the practical needs of the school. In many cases, this was talked about in terms of the need for the government to conduct pilot research for the new curriculum or to "do a study" of the impact of a new curriculum on schools prior to implementing it:

> They make policies without making research. It's my idea that sometimes in the policy, there are good things, but if you come to the schools, it doesn't go with the policies. There is a lack of teachers, and the number of students is too high—so many problems are there. So, the policy doesn't go with the school condition. A lot of things should happen. A lot of change should happen. Research should be done. (Iyob, Interview)

Teachers criticized the policy reform on the grounds that the policymakers did not conduct research on the feasibility of the new curriculum in terms of the realities of the schools and did not consult teachers, the experts on these realities of the schools. Teachers not only considered themselves the local experts when it came to understanding the real conditions of the schools, but also believed that they should be the primary informants in research conducted in conjunction with educational policy change. By failing to conduct research, teachers contended, the government was implementing the policy change erratically and haphazardly.

Analysis

Teachers' awareness that the way they had traditionally taught was now labeled "archaic" did not sit comfortably with their self-identification as local experts on education or with their vision of their work as contributing to the modernization and development of Eritrea. What teachers viewed as their own modernization efforts—creating disciplined, knowledgeable, educated citizens—clashed with the government's new modernizing project of creating a "flexible" worker (Muller 1998; Tabulawa 2003). To reconcile this tension, teachers constructed what I have called a discourse of pragmatics, whereby they did not criticize the new pedagogy specifically, but launched a thorough critique of its applicability within the local context of their school. Teachers' pragmatics revolved around the material conditions that made it impossible to implement the new curriculum, the motivation level of students and teachers, and the expectations of schooling itself.

James Scott's (1998) term *metis* illuminates teachers' view of themselves as "local experts" on the conditions of the schools and the work of teaching, which they used to rationalize choices regarding teaching practice. *Metis*, or locally responsive expertise, can be contrasted with *techne*, the ostensibly rational, scientific expertise that the government drew on when imposing its modernist project of pedagogical change in Eritrean schools. However, as they apply to teachers, these concepts are complicated by teachers' understandings of themselves as modern. In fact, teachers' self-identification as educated persons and the work of teaching complicate Scott's dichotomy between local (*metis*) and expert (*techne*) knowledges. Although the work of teaching requires *metis*—it is comprised of intuitive practices based on an understanding of local conditions—the content of what is taught derives from forms of knowledge that might be considered *techne*—knowledge, which comes from external expertise, is based on a faith in scientific reason and promotes the modernist project. The idea of basic knowledge and beliefs about the proper sequencing of the curriculum reflected the notion that knowledge is something that comes from "outside" the local context. Basic knowledge, which the experts determined was what students should learn, provided a blueprint for what the educated person should know and thereby defined how schooling should create modern subjects. Basic knowledge did not need to be responsive or relevant to students or local conditions, but

rather was based on an external standard and was thought to provide students with a framework through which to become modern.

When attempting to enact learner-centered pedagogies in the classroom, teachers' reactions were shaped by their entanglement in these two very different versions of modernity. Many teachers stuck with the "old" methods, while others reinterpreted learner-centered methods in teacher-centered ways. Still others adopted what were clearly learner-centered methods in a limited manner. At times, these methods, at times, did provide a space in the classroom for students to think creatively and critically, although not always in the ways that teachers felt they could control.

Conclusion

The issue of pedagogical reform in Eritrea reveals a complex picture of intersecting teacher practices and beliefs. The change in pedagogy designed to make education more "practical" did not change much in the ways that teachers taught, but it did effect some change. As there was no mechanism to force teachers to change the way they taught or to regulate the pedagogies used in classrooms, teachers could resort to traditional ways of teaching and construct hybridized practices that combined new and old methodologies.

Both policy discourse and teacher discourse on the new curriculum hinge on different actors situating themselves in two ways—first, as the experts on what works in schools, and second, as the guardians of modernity. By focusing on so-called modern teaching techniques such as learner-centeredness, policymakers cast the curriculum itself as modern and teachers as backward. By focusing on the feasibility of the new curriculum and the difficulties of implementing it, teachers positioned themselves as experts on the reality of the school, effectively asserting that their own "practical" knowledge about classroom conditions (*metis*) should be taken into consideration before new policies were set. Teachers generally constructed themselves as capable of teaching in "new" ways if they were given the necessary support (texts, materials, training, manageable class sizes) and conditions (motivated students with appropriate expectations about what should happen in classrooms) to do so, but asserted that these new methods were not appropriate, given the current conditions in Eritrea and in the Eritrean school system. Teachers believed themselves to be the experts on what would work in this practical realm.

This reveals an interesting relationship between *metis* and *techne* (Scott 1998). Teachers asserted their own value as local experts on the local conditions in schools (*metis*), but they also valorized what Scott refers to as *techne* or expert knowledge derived from research and external sources. They saw the two forms of knowledge as necessarily working together. They believed that government should have a well-conceived plan to create, evaluate, and implement a new policy based on external "expertise" and scientific, rational research processes. Yet, teachers also imagined that they, as local experts and professionals, should have been included in this process of evaluation, research, and policy setting. Instead, the state was seen as having haphazardly implemented a policy that in teachers' view undermined the quality of education as well as their own expertise. As a consequence, the state was seen as failing to behave in a scientific, rational, and modern way, while teachers upheld belief in their role as promoters of their version of modernity. Furthermore, teachers were left to cope with the chaos created by the implementation of new policies and to do their best to educate students and prepare them for the roles that teachers believed they should play, as educated citizens, given the practical challenges of teaching under difficult and chaotic conditions in schools.

Through the discourse of pragmatism, teachers created a space in which they believed they were justified in determining what was and was not appropriate for their classes. This commentary on pragmatics cast teachers, and not the curriculum writers, as true experts, based on their understanding of teaching and the nuances of the classroom. It also set the stage for a subtle form of pedagogical resistance to the new educational ideals being imposed. Attending to teacher critiques and to the local, embodied knowledge on which it is based is, therefore, important, as it makes teachers allies in, rather than objects of, curriculum reforms.

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CHAPTER 10

The Significance of Doctoral Education and Training for Development in Sub-Saharan Africa

Melody Mentz-Coetzee, Aldo Stroebel, and Frans Swanepoel

Introduction: Africa—A Continent of Hope in the Midst of Continuing Turmoil

Africa is changing—it is becoming a continent of hope. While much of the developing world was mired in financial difficulties and economic stagnation, Africa's growth remained resilient against the background of a challenging external environment (African Development Bank 2018). Growth on the continent is expected to remain strong with 24 countries expected to see their per capita income rise faster than the rest of the world in the immediate future (IMF 2019).

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Furthermore, Africa's global trade increased by more than 200 percent from 2000 to 2011 (Robertson 2012), and percentage change from 2016 to 2018 was amongst the highest in the world (UNCTAD 2018); secondary school enrollment has increased from 3 percent in 1960 to 50 percent in 2015 (African Union Commission 2015a); and the middle class has tripled to nearly 350 million people (WEF 2017).

This positive growth has led to increased disposable income, which has made a visible difference in access to technology across the continent. For example, in 2016, two-fifths of people in sub-Saharan Africa had mobile phones (*Economist* 2017); there were 525 million Internet users in 2019 (*Business Insider SA* 2019) (compared to 4.5 million in 2000); and there were seven fiber optic cables connecting sub-Saharan Africa to the world in 2012, compared to only one in 2007 (Robertson 2012). Africa is, thus, currently more well-connected to the world than ever before—a situation that presents the continent with a unique opportunity to connect and collaborate globally, for its continued and sustained development over the coming decades.

There is another side to Africa's development, however. Africa is home to nine of the 12 least competitive countries in the world, and development rates are very uneven across countries (WEF 2017). Approximately half of the world's extreme poor are found in this region (World Bank 2019), and 20 percent of all Africans are undernourished (FAO et al. 2017).

Although decreasing in proportion, in 2012, 43 percent of people in sub-Saharan Africa are among the extreme poor (living on less than US$1.90 a day) (2011 purchasing power parity) (World Bank 2015a). Recent data show that the number of those in extreme poverty in Africa continues to rise in absolute numbers (UN DESA 2019). Few African countries achieved the Millennium Development Goals (MDGs) by 2015 (World Bank 2015b), and all African regions except North Africa are unlikely to meet the SDGs (Begashaw 2019). Immediate skills shortages need to be addressed to ensure continued economic and social development.

In addition to the achievements and challenges presented above, Africa is faced with a set of circumstances that present themselves as both a potential asset and an imminent risk. The continent currently has a young workforce, where African youth constitute over 60 percent of the continent's 1.2 billion population (AfDB 2016). Youthful populations of this nature (known as the "youth bulge") are associated with both the opportunity for rapid economic growth, as well as with the risk of high levels of

conflict and unrest in the face of limited job opportunities and poor economic prospects (Urdal 2006; Cincotta and Madsen 2011).

Africa is thus at a point of unprecedented opportunity, which demands intentional, considered, and immediate action.

Science and Innovation as Drivers of Development and Equality in Knowledge Economies

Modern society offers a multitude of opportunities for a renewed contract between science and society to promote sustainable development and improved quality of life. The Sustainable Development Goals (SDGs) clearly show the complexity and scope of the challenges facing modern society, including the elimination of poverty and hunger (UN 2015). The unprecedented global environmental, social, financial, geopolitical, and technological challenges compel science to be more relevant to the societal context and to establish an optimal nexus between these two domains. At the core of this nexus is the assumption that in order to strengthen sustainability within societies and to achieve high levels of economic competitiveness, science must be a sound, reliable, and cutting-edge driver of change at multiple levels. This notion of the so-called "knowledge economy"—linking knowledge to economic and social development—emerged in the 1990s and has since become widely accepted (Castells and Cloete 2011).

In sub-Saharan Africa, there is growing acknowledgment of the importance of science in driving multilevel development. Under auspices of the African Union's "Agenda 2063: The Africa We Want" (African Union Commission 2015b), political support for the role of science, technology, and innovation has reached an apex. Furthermore, in 2014, the Science, Technology and Innovation Strategy for Africa (STISA-2024) was accepted by heads of state and governments (African Union Commission 2014). On the continent, there is thus unprecedented support for science and technology as enablers of development. This high-level support was confirmed at the African Higher Education Summit on Revitalizing Higher Education for Africa's Future (March 2015, Dakar, Senegal), attended by academics, governments, members of the African Academy of Sciences, donors, and civil society actors. Most recently, this high-level political commitment has been consolidated in 2018 by the establishment of the Committee of Ten Heads of State to Champion Education, Science

and Technology (C10) by the AU (Assembly Decision AU/Dec.671 and Assembly/AU/Dec 572) to support greater use of STI for development, and to accelerate the implementation of STISA 2024. Emerging from the first C10 meeting in 2018, a joint declaration and action plan unanimously affirmed that higher education is fundamental to both development and democracy in Africa. Higher education, therefore, has the responsibility to produce the human capital required to reposition Africa as a major global actor, where Africa's resources are utilized to the benefit of Africa's citizens.

Research and knowledge production are accepted as core activities central to knowledge economies. The number of publications produced annually has grown steadily by approximately 3 percent per year over the past two decades, with an upward acceleration in recent years. In the past two decades, the rate at which scientific papers have been produced globally has doubled. In rapidly expanding economies, publication output has more than doubled in as little as 10 years (Ware and Mabe 2015).

This rapid expansion is, however, not reflected in African universities. Africa's world share of publications only increased from 1.6 to 2 percent, between 2002 and 2008 (Zeleza 2014) and then to 3.2 percent in 2016 (Beaudry et al. 2018). Disconcertingly, only two countries, namely, South Africa and Egypt, continue to dominate research in Africa, having contributed 37 and 27 percent to total output from 1999 to 2009, respectively (NPCA 2014), and 28 and 20 percent, respectively, from 2011–2015 (Beaudry et al. 2018). While South Africa and Egypt dominate the southern and northern regions, Nigeria leads research in west central Africa, and Kenya in the eastern region (Zofou et al. 2011).

To a large extent Africa's success in achieving the targets set forth in "Agenda 2063" and "STISA," as well as establishing itself as a competitive knowledge economy, will be dependent on the continent's ability to trans–form its contribution to global scientific output. This will require not only an increase in financial investment, but also a significant increase in investment in human capital development.

The PhD as the Foundation of Establishing and Sustaining Knowledge Economies

The PhD is considered a pinnacle qualification—broadening the frontiers of knowledge, enabling job creation by equipping candidates to work in multiple contexts, and establishing a base for an innovative and entrepreneurial knowledge society. Globally, institutions of higher edu-

cation of exceptionally high repute have greater proportions of staff with PhDs (Salmi 2009; Altbach and Salmi 2011), and the qualification is considered essential for the regeneration of the academic research corps in universities.

Not only is the doctoral qualification necessary for the regeneration of the academic corps, but evidence continues to grow in support of the significant relationship between the number of doctorates and global competitiveness. Although the debate continues about the exact relationship between PhD production and economic growth, it is hardly questionable that talent in the form of human capital is fundamental to economic activity and development—regardless of whether the relationship is direct or indirect. The PhD qualification is thus the foundation and a fundamental driver of development and equality in modern society (most certainly, in Africa), and is increasingly becoming an area of interest (Cloete et al. 2015).

It is, thus, not surprising that there has been explosive growth in the number of PhDs in the world. Internationally, there has been a 40 percent growth in doctoral graduates between 1998 and 2008, to some 34,000 in Organisation for Economic Co-operation and Development (OECD) countries. This growth shows no sign of slowing in the context of the link between high-level capacity and economic growth. Countries with a vibrant science and technology system produce more than 150 PhDs per million of the population annually (Cyranoski et al. 2011).[1] Growth in PhD production is not uniform across the world, with countries that already have high levels of doctorate production (for example, Germany, Canada, United States, United Kingdom) growing at approximately 5 percent or less, while fast developing countries are growing doctoral output at more than 7 percent, with Mexico (17 percent) and China (40 percent) growing at exponential rates (Cyranoski et al. 2011).

However, in sub-Saharan Africa, underdeveloped research functions at institutions created constraining environments within which graduate education—in particular, doctoral education—could not flourish in line with the trends described here. Participation in doctoral education on the continent lags well behind the participation rates of developed countries and is even lower than in some developing countries (Cloete et al. 2015). It is estimated that only 1 percent of students in higher education within

[1] Switzerland (454), Sweden (427), United Kingdom (288), Australia (264), United States (201), France (172), Japan (132), Turkey (48), Mexico (28), and Chile (13).

the Southern African Development Community (SADC) region are enrolled for doctoral programs (Jørgensen 2012). Compounding the problem of low enrollment is the high rate of dropouts and the average length of time taken to attain a PhD (Mouton and Cloete 2013; Bunting et al. 2014).

As a proportion of a country's total population, African countries produced fewer doctoral graduates than other countries at comparable developmental levels. Perhaps, even more disconcerting in Africa is that even the best performing countries and flagship universities currently underperform, in terms of PhD and knowledge production. The Higher Education Research and Advocacy Network in Africa (HERANA) study (covering eight flagship institutions in Africa over 11 years) vividly illustrated how dire the state of PhD production is on the continent (Bunting et al. 2014). The total PhD enrollment at eight flagship institutions was only 2614 in 2011, almost half of which was at a single institution in South Africa.

Box 10.1 Illustrative Profile of Higher Education Systems in Africa: Ethiopia

Ethiopian higher education, as in most African countries, has been characterized by rapid massification and growth.

- The number of public universities grew from two in the mid-1990s to 36 in 2015. Plans indicate about a dozen new public universities by 2020.
- Within the period 2000–2014, undergraduate enrollments grew at an annual average rate of 34 percent.
- The number of public universities offering PhD programmes reached ten in 2016 from only one in 2005.
- The country has had a very ambitious plan to produce 5000 PhDs in 10 years. While the target is far from being met, enrolments in PhD programmes increased from 64 in 2006 to 3135 students in 2015. PhD enrolment in public universities is expected to rise to 6500 by 2020.
- The number of PhD graduates has increased a high of 335 by 2015, but there are clearly challenges of throughput (with the average time to graduation being six years) and completion (with some students dropping out along the way).

(*continued*)

Box 10.1 (continued)

- There is still a big shortage of qualified staff with PhD degrees in the public universities. Across all higher education institutions in Ethiopia, only 8 percent of staff hold a PhD qualification.

The government has been using various strategies to achieve the targets set for PhD production. These include partnerships with other universities. At the same time the government is encouraging joint PhD programmes and scholarships with European universities. Some of these have been funded by international agencies such as the German Academic Exchange Service (DAAD), Netherlands Organisation for International Co-operation in Higher Education (NUFFIC) and the VLIR program funded by the government of Belgium. The Swedish International Development Cooperation Agency (SIDA), Department for Research Cooperation (SAREC) has supported scientific research in Ethiopia with significant funding. The total estimated amount is more than US$100 million since 1975 (ANIE 2018).

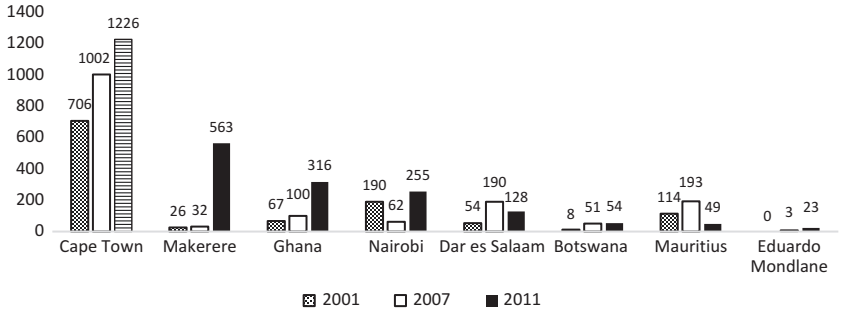

Fig. 10.1 PhD enrollments: Flagship universities (HERANA study), 2001–2011. (Source: Bunting, Cloete, and van Schalkwyk (2014))

Figure 10.1 illustrates the enrollment data for the eight institutions at three points (2001, 2007, and 2011).

The HERANA study (Bunting et al. 2014) also showed the low levels of graduations in the flagship institutions, with only a combined total of

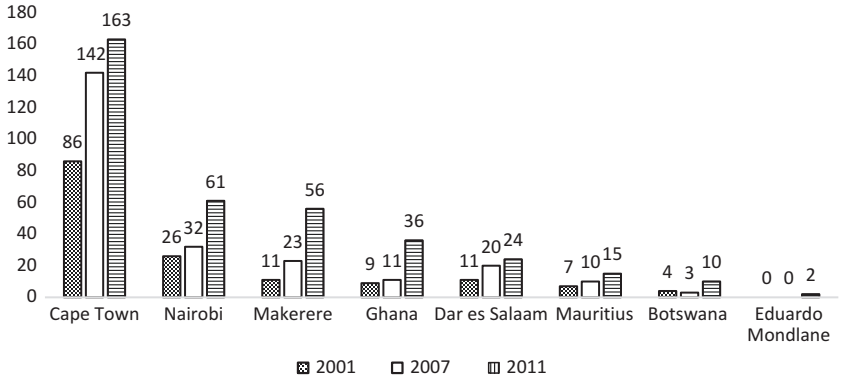

Fig. 10.2 PhD graduations: Flagship universities, HERANA study, 2001–2011. (Source: Bunting, Cloete, and van Schalkwyk (2014))

367 in 2011 (see Fig. 10.2 for disaggregated graduation data at the same three points in time). In contrast (and as a point of reference), the University of São Paulo, in Brazil, raised its doctoral production from 800 to 10,000 graduates per year in 20 years (1984–2004) (Namuddu 2014).

One potentially encouraging factor in Africa is that there has been significant growth in master's degree enrollments, but to date, this has not yet translated into a concomitant increase in doctoral enrollments. By way of illustration, of the participating institutions in the HERANA study, three had a master's-to-doctoral ratio of higher than 10:1, and three had ratios above 50:1. This is in stark contrast to the ideal ratio of no more than 5:1 Much has been written about the pipeline imperative (ASSAf 2010), and based on the analysis herein, addressing the so-called higher level pipeline must remain an important priority for African institutions.

Measures to address the current status quo and the importance of the PhD was clearly affirmed at the 2015 African Higher Education Summit, which called for the development of a strategy to expand to "average levels [of PhD enrollment] for emerging economies within 15 years, and to become a global pole of scientific productivity by 2063, with [Africa's] global share of young PhD graduates and publications proportional to its share of global population demographics, which are projected to be 40%" (Trust Africa 2015, 21). Furthermore, in its declaration, the Summit

proposes that by 2063, all staff within higher education institutions in Africa should have terminal degrees (that is, PhDs) (Trust Africa 2015).

Toward Overcoming Constraints in Achieving the PhD Imperative in Sub-Saharan Africa

The continued escalation of PhD production in Africa is an urgent priority, requiring far-reaching and decisive action. Although this is self-evident, there are many challenges to overcome. A set of negative self-reinforcing circumstances contributes to sub-Saharan Africa's lower level of PhD production. From the literature related to the challenges in developing and promoting doctoral education, a few prominent issues are observed (Cloete et al. 2017; Teferra and Altbach 2004; Harle 2011; van't Land 2011). In summary, lack of funding both for institutions and for student bursaries, the absence of appropriate incentive schemes (leading to an unregulated consultancy environment), and the lack of adequate infrastructure for research have contributed to the unvirtuous cycle. Compounding the challenge, too few institutions offer doctoral programs, and institutions offering programs have inadequate numbers of appropriately qualified/experienced supervisors (that is, staff with PhDs). The confluence of these factors means that there is not an enabling environment for research at universities in Africa. Lack of strategic positioning exacerbates the problem. Universities continue to experience pressure from government with regard to their academic freedom (while remaining largely unresponsive to national priorities); typically, have weak linkages to industry; and tend to compete rather than collaborate.

Box 10.2 Illustrative Profile of Higher Education Systems in Africa: South Africa

South Africa produced 26 doctorates per million of the country's total population in 2007, and currently produces 49 doctorates per million of the total population (2600 per annum) (Department of Science and Technology 2011; National Planning Commission 2013; Mouton et al. 2019). This is compared to 569 per million in Portugal, 187 per million in Korea, and 48 per million in Turkey (ASSAf 2010).

(*continued*)

Box 10.2 (continued)

Despite South Africa's comparatively better performance, the country must still make substantial gains to achieve global competitiveness. The number of PhDs produced per annum must increase substantially from approximately 1900 to 6000 by 2030 (National Planning Commission 2013). It is anticipated that this increase in PhDs will translate into significant increases in publication outputs, to the point where South Africa increases its contribution from the current 0.55 percent to 1 percent of the global R&D outputs annually. To achieve this increased output, South African universities will inevitably require an increased number of appropriately qualified staff who can supervise this increasing pool of doctoral candidates. The National Development Plan (NDP) of South Africa appropriately acknowledges this challenge by proposing an increase in academic staff with PhDs, from the current 34 percent to 70 percent by 2030 (ASSAf 2010; National Planning Commission 2013).

Finding ways to address these challenges effectively and efficiently is a prerequisite to enabling the production of adequate numbers of PhD graduates in the coming decades in sub-Saharan Africa. Addressing these challenges is by no means an uncomplicated or short-term endeavor. Collaborative and collective efforts will be required to increase both the rate and quality of PhD production and eliminate blockages that have historically constrained this flow.

Box 10.3 Illustrative Profile of Higher Education Systems in Africa: Kenya

In 2010, Kenya had 7 public universities and a number of constituent colleges. In 2012, the number of universities increased to 8, and to 22 in 2013, when 15 new universities that were hitherto university colleges were created. There are also 9 constituent colleges of public universities and 17 chartered private universities.

Since 2003, with more government involvement in steering policy and development, enrollment increased from 82,095 students to

(*continued*)

Box 10.3 (continued)

361,388 students in 2013. This was an increase of 400 percent. Despite the fast expansion of enrollments, gross enrollment ratios are still comparatively small, and increased by 1 percentage point, from 3 percent in 2008 to 4 percent in 2013.

Comprehensive data for PhD 0-level enrollments for all the universities are not available. Data from the Kenyatta University students' records office reveals that there were 1002 active PhD students enrolled in the institutions in the 2013–2014 school year. This is part of a total student enrollment of 70,006. This means that PhD enrollments constitute 1.4 percent of the total student enrollment at Kenyatta University. Analysis from graduation trends at Kenyatta University show that PhD graduates constituted 0.8, 0.8, and 0.7 percent of total graduates for the years 2011, 2012, and 2013, respectively. The same trend is replicated in the University of Nairobi, where PhD graduates constituted 0.57, 0.37, and 0.82 percent of total graduates for the 48th, 49th, and 50th graduations, held from December 2013 to December 2014 (Ogachi 2014).

In the efforts to increase PhD production, a number of tensions must simultaneously be managed. Mouton, Boshoff, and James (2015) highlighted four key issues that need attention, namely: growth, efficiency, transformation, and quality. Therefore, the increase in number of PhDs should not compromise the quality of the graduate. Managing this tension is closely interlinked to balancing efficiency (that is, decreasing the time to graduation) with quality and effectiveness. The sector does not only need more PhDs quickly, but also requires high-level skills from graduates who are capable of contributing meaningfully to knowledge economies. The solutions to and proposals for addressing the challenges of PhD output must, therefore, remain cognizant of this set of interrelating factors. Toward this end, the International Association of Universities and the Catalan Association of Public Universities (IAU–ACUP) 2012 report identified, inter alia, the need for an increase in funding, an emphasis on networking/collaboration, and a reconsideration of modes of delivery as strategies for increasing PhD productivity, in a manner that balances qual-

ity with growth and efficiency (IAU–ACUP 2012). Cloete et al. (2017) further identified the need for supportive government policies and appropriate government funding frameworks as critical areas for attention. These strategies, by no means, reflect the full scope of what is needed to address the situation. They do, however, highlight overarching approaches and principles, which, if implemented on a large scale, have potential to address a number of challenges the sector currently faces and offer increased potential for higher education to positively impact development and quality. These three overarching approaches are elaborated upon further in this chapter. The arguments and assertions brought together in these three approaches combine both literature and, in particular, the collective insights of the stakeholders and role players engaged in recent continental-level discussions.

Soliciting Sustainable Funding from Diverse Sources

Adequate sustainable funding for tertiary education across Africa is a critical concern. If this need is left unaddressed, it will significantly hinder the capacity of the sector to achieve its vision of contributing meaningfully to development. Securing sustainable funding from diverse sources (including government, donors, industry, and society) can thus be considered one of the primary action areas (Stroebel 2015). While funding for PhD programs and students is needed, increased resources to strengthen research at the institutional level are inextricably linked to producing high quality PhD graduates. Thus, funding for higher education should be considered holistically rather than from the narrow perspective of increased funding for PhDs only.

Government is and will remain one of the largest sources of funding for higher education. Although total government spending on tertiary education in Africa has not declined (in many cases, it has in fact increased Kotecha 2012), it remains problematic, because funding has not kept pace with the growth of tertiary education systems across the continent. Governments, thus, should be lobbied to take their role in funding PhD programs and students seriously, in the interest of national development. However, as the sector continues to expand, government funding will be stretched even thinner, and a concerted targeted approach to diversifying the funding base will become necessary.

Donor funding will remain a valuable resource in Africa for at least the foreseeable future. However, as financial markets shift and economic uncertainty continues, donor funding should be seen as a supplement to other sources of funding, rather than as the basis of funding support for PhD production. African ownership of African scholarship should increasingly become evident, not least of all through African investments in higher education and PhD production. A case in point is the successful partnership model of the Carnegie Corporation of New York with a number of so-called *anchor universities* on the African continent, with co-investment and joint planning as prerequisites. The African Doctoral Academy at Stellenbosch University in South Africa, with Carnegie support, provides a number of doctoral programs to other African countries to increase PhD production.

From this viewpoint and in recognition of the proposed contribution of research and higher education to a country's economic and social development, it stands to reason that industry and private sector investment in research has potential for mutual benefit. Thus, it is argued that incentives for industry and the private sector should be developed and implemented. Innovative approaches and policies are needed to stimulate this action, including research levies and tax deductions.

Although adequate funding for higher education and, by implication, PhD production is important, it is not sufficient in and of itself to address all the challenges faced on the continent. As has been demonstrated in this chapter, given the enormity of the challenge at hand, no role player can seek to overcome the hurdles singlehandedly. Effective collaborative efforts are becoming increasingly essential, due to their potential to leverage impact in the context of limited resources.

Harnessing Collaborative Opportunities and Collective Strengths

If African higher education seeks to adequately improve its competitiveness of PhD production, it will be important to focus on a renewed regional approach with appropriately selected beneficiaries. This has been recognized by multiple role players and stakeholders, evidenced by the numerous initiatives and collaborations already in existence. This chapter suggests that three types of collaboration, partnership, and networking are necessary to escalate the production of PhDs to the requisite level in Africa. Examples of each of these are provided.

Collaborative Discourse, Advocacy, and Consensus Building

Working from the assumption that the challenges in PhD production cannot be overcome by single institutions, organizations, or efforts, it is necessary for stakeholders from diverse sectors and across geographical boundaries to engage in discourse and work toward consensus around what is needed to overcome these challenges. Such platforms and dialogues stimulate African-led conversation between and among universities and networks that have doctoral training programs—in order to share experiences, capacities, and resources, and to provide a platform for better coordinated advocacy for policies on higher education at national, regional, and continental levels.

As mentioned, the Carnegie Corporation is one such example of an institution that has demonstrated commitment to the much needed revitalization of higher education on the continent through various initiatives, although by its mandate it targets anglophone institutions. The Corporation's main priority for investment in Africa is capacity development of staff in African universities. During the period 2013 to 2015, Carnegie was involved in three prominent events that focused specifically on increasing the production of PhDs on the continent.

The first, held in October 2013, was an Africa-wide workshop in partnership with the National Research Foundation (NRF) of South Africa to examine the state of PhD production on the continent. The workshop's objectives were to provide a networking opportunity for participants to encourage relationships at a number of levels deemed appropriate to advancing and strengthening PhD production, to analyze and synthesize the issues and constraints currently hindering the number of quality PhDs produced, and to determine what actions can collaboratively be taken between appropriate stakeholders to enable increased PhD production in Africa. This initial workshop served as a seminal event from which a number of other dialogues and activities have emanated.

The second, an extension of the October 2013 workshop, focused on escalating the production of PhDs in the agricultural and life sciences, and was held as a side event to the biennial Regional Universities–Forum for Capacity Building in Africa (RUFORUM) conference in Mozambique in July 2014. The workshop sought to identify critical enhancement opportunities and to consider possibilities for expanding strategically selected partnerships and alliances in the region.

The third event was a high level, two-day roundtable discussion held during October 2014. The main objective of this convention was to

accomplish a clear purpose and drive toward decision-making and alignment to inform the Continental Summit on Higher Education held in March 2015, in Dakar, Senegal. The three-day continental summit, themed "Revitalizing Higher Education for Africa's Future" (referred to earlier), sought to build a movement of like-minded institutions to transform the African higher education sector. A constituency for transformation and investment in Africa's higher education was established, creating a shared vision for the future, highlighting exemplary efforts and initiatives, and seeking opportunities for synergy and collaboration. The Declaration and Action Plan of the first African Higher Education Summit on Revitalising Higher Education for Africa's Future (2015) was the tangible output from the Summit.

Collaborating to Expand Academic Offerings and Enable Quality

A deeper level analysis of the programs and capacity within African universities makes it clear that collaboration between academic institutions (within and between countries) is the most expedient manner to broaden opportunities for doctoral level study, without compromising quality or overextending limited resources and capacity. The Continental Summit on Higher Education confirmed this assertion and proposed the identification and development of 200 universities in Africa to constitute a hub of excellence in knowledge citizenship and relevance to the key needs of development. The launching of the African Research Universities Alliance (ARUA) was a further result of the summit, launched by 15 universities from eight African countries. Ultimately, the "do-it-all" notion must be replaced with a commitment to excellence and focus.

There is an emerging and growing consensus that the African higher education sector should be reengineered toward differentiation and diversification to develop pockets of excellence in a limited number of sites that still cover a broad range of disciplines. Selected sites could focus on specific areas of study, with fewer institutions offering PhD programs but of better quality. Strong collaborative networks and partnerships will be a critical component for enabling access to these programs across institutional and geographical boundaries. A pertinent example is the Pan African University (PAU), a postgraduate training and research network of university nodes in five regions, covering five thematic areas (of which four are currently operational). When fully deployed, each PAU thematic institute will be linked to 10 satellite centers with complementary thematic specializations, and interdisciplinary and transdisciplinary programs. At full operational

capacity, the PAU will incorporate 50 centers of excellence under its five academic hubs across Africa.

Regional networks and consortia are outstanding current examples of how this type of collaboration is made possible. While the university remains the major site for doctoral training, over the past 30 years, networks have emerged that are also involved in doctoral training. Examples of successful networks include the African Economic Research Consortium (AERC), the Consortium for Advanced Research Training in Africa (CARTA) (one of seven consortia that comprise the Wellcome Trust's African Institutions Initiative), the Council for the Development of Social Science Research in Africa (CODESRIA), RUFORUM, and the Regional Initiative in Science and Education (RISE).

Collaboration Between Science Councils and Higher Education for Escalated PhD Production

Science councils have an important role to play in sourcing the requisite resources and facilitating partnerships for PhD production. The National Research Foundation (NRF) in South Africa is an outstanding example for the potential role that councils can fulfill. The NRF has been a fully engaged partner in the Carnegie projects, described previously in this chapter, in addition to providing substantial support to graduate students (within and outside South Africa). To further strengthen a robust network for human capital development on the continent, South Africa, through the NRF and the former Department of Science and Technology (DST) (now Department of Science and Innovation), has bilateral cooperation agreements on science and technology with 22 African countries, nine of which had joint research calls with South Africa. The nine active bilateral agreements have resulted in over 229 projects jointly funded, with an estimated *joint* contribution of over US$8 million during the past five years. The nature of each agreement is determined by the needs of the country involved and covers a wide variety of thematic areas and disciplines. The NRF has developed strategies to broaden and deepen its engagements on the African continent. These include, inter alia, the Science Granting Councils Initiative (SGCI) aimed at strengthening other science granting councils in Africa, increasing programs supporting African master's and PhD students, and promoting innovative funding modalities to internationalize South Africa's research platform. The SGCI Phase I was a major

5-year initiative (2015–2020)[2] to support and build capacity of 16 science granting councils in sub-Saharan Africa, launched by the NRF, the United Kingdom's Department for International Development (DFID), and Canada's International Development Research Centre (IDRC). The Swedish International Development Cooperation Agency has since joined as a co-funder, as the Initiative prepares for Phase II. Collaborations of this nature should be harnessed more broadly for greater impact.

Reconsidering Modes of Delivery and Innovating Around Capacity

Establishing a collaborative, engaged, and impactful system for producing high quality PhDs, with the intention of the graduates contributing to developmental outcomes, will require a radical reconceptualization of how doctoral education is both designed and delivered. The traditional view of the doctorate is of a student, under the guidance of a supervisor (usually only one), undertaking original research and producing a dissertation within a specific field of study. This model is still currently dominant in most of Africa. In Europe, although this model is still prevalent, the emergence of structured programs, which include formal learning and usually incorporate some form of related assignments, have emerged. Graduate or research schools offer courses of study in research methodology and related theory and create an environment within which prospective graduates interact with each other as well as with established researchers (Cloete et al. 2015).

In the United States, graduate schools have in fact now become the norm, and doctoral programs typically include coursework covering areas of advanced study and research methods and subsequent examinations. In general, such schools provide a nodal point for the standardization and management of graduate education within a university, and sometimes host programs or degrees that do not fit comfortably into conventional faculties, colleges or departments. In addition to catering to the immediate needs of graduate students and providing required courses and those recommended by committee members, graduate schools commonly also host scholarly seminars and public lectures. They can thus stimulate the broad and informal, transdisciplinary conversations that are becoming such a significant informal curriculum for "new generation" knowledge

[2] https://sgciafrica.org

globally (Nerad and Heggelund 2008; Bitzer et al. 2014). These international trends in postgraduate education highlight the importance of expanding the nature of master's and doctoral educational programs beyond discipline-specific research skills to encompassing the development of transferable skills for the modern world of work, such as proposal writing, fundraising, leadership, time management, mentorship, transfer of knowledge, engagement of policy constituencies, translation of research results into social action, as well as monitoring and evaluation of impact.[3] In addition, many programs require, or at least encourage, their doctoral students to publish part of their ongoing research for their PhDs in peer-reviewed journals.

Alternative models have emerged in the United Kingdom, including a PhD by publication, consisting of peer-reviewed academic papers and a professional doctorate with a significant portion of taught elements, usually incorporating specific learning outcomes (work-focused); and the practice-based doctorate, which may consist of a novel or a performance as its output (Cloete et al. 2015).

In response to these trends and taking into consideration the proposed collaborative models needed in Africa, reconceptualized modes of delivery for doctoral training must be considered, including split-site PhDs (for example, "sandwich" programs), double degrees, joint degrees, and cotutelle (joint supervision) degrees.

Conclusion

The Sustainable Development Goals (SDGs) (UN 2015) have contributed to defining the development agenda for the next 15 years. Although higher education and science are not directly articulated as development goals, they underpin modern society's capacity to identify appropriate solutions for achieving the articulated goals. High-level research skills, such as those acquired and nurtured through PhD study, are therefore a fundamental link in development.

The Continental Summit on Higher Education unapologetically stated that Africa has a critical role to play in creating the knowledge that will contribute to solving its own problems. It must be African scientists, in

[3] The African Doctoral Academy, as well as the Southern African Systems Analysis Centre (SASAC), are outstanding examples of sustained engagement of a variety of "new" and innovative approaches that encompass transferable skills.

collaboration with others, who can truly understand African developmental challenges and work toward eliminating them. Thus, escalating the production of PhDs in Africa is exceptionally valuable and relevant at this time.

In addition to taking responsibility for the status quo on the continent, African stakeholders—including governments and universities—need to take seriously the question of how best to understand the value and impact of science for society. This can only be achieved through rigorous monitoring and evaluation efforts that are supported by well-designed and effective data and information management systems. Only when these are in place can the true impact of investments be known. Simply proliferating PhDs is inadequate; understanding the true value as a driver of development is imperative.

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CHAPTER 11

What Kenyan Youth Want and Why It Matters for Peace

Elisabeth King

In sub-Saharan Africa today, 43 percent of the population is under 15 years of age, and the absolute number of youth is growing faster than anywhere else in the world. Two-thirds of Africans are younger than 25 (UNESCO 2012, 177). For many, this demographic structure is cause for concern. A number of oft-cited studies show that a large cohort of youth, termed a "youth bulge," is associated with various forms of violence, from crime to terrorism, from rebellion to civil war (Goldstone 1991; Huntington 1996; Urdal 2006; Collier 2007). Yet, both academic and policy literature present alternative views, framing the unprecedented number of youth today as a dichotomy—a disaster or a dividend, a peril or a promise, youth as "troublemakers or peacemakers" (McEvoy-Levy 2006; UN News Centre 2015)—with the outcome depending on global, national, and local policies and programs.

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Education and employment are often the focus of such policies and programs. At a 2014 speech to the United Nations, President Obama advocated for "expand[ing] our programs to support entrepreneurship and civil society, education and youth—because ultimately, these investments are the best antidote to violence" (White House 2014). Indeed, education and jobs have been widely endorsed by international development and peacebuilding actors, as the keys to providing youth with prosocial, peacebuilding pathways to citizenship and adulthood (World Bank 2012; IMF 2015; Global Partnership for Education 2016; World Bank 2016).

However, existing evidence suggests that faith in such programs may be misplaced. While cross-national studies show correlations between higher average levels of formal education and a lower risk of violent conflict (Collier and Hoeffler 2004; Barakat and Urdal 2008), in a number of cases, perpetrators of violence are more educated than the average population (Krueger and Maleckova 2003; Straus 2006), and in still other cases, education may itself contribute to conflict (Burde 2014; King 2014). Convincing evidence for a positive relationship between employment and peace is even more problematic, with recent studies failing to find a significant positive correlation (Cramer 2010; Berman et al. 2011; Holmes et al. 2013; Izzi 2013; Blattman and Ralston 2015). These results beg the question of why this is so.

This study offers one possible explanation for the disconnect between, on the one hand, the tremendous faith and commitment to education and employment programs aimed at youth peacebuilding, and on the other, disappointing results. It shows that a "dominant discourse" built principally on simple economic logic underlies youth education and employment programs targeting peace. Nonetheless, we know little about if and how this dominant discourse aligns with the identity and aspirations of youth and how they understand and negotiate their everyday lives. Indeed, voices of youth are typically omitted from this research altogether. This study helps address these issues through an in-depth study of youth aspirations in Nairobi, Kenya. It draws on a survey of nearly 250 youth, 6 focus groups, and over 100 qualitative interviews with youth, as well as with representatives of government and international organizations that work with youth. This study argues that, typically, at least two crucial issues are overlooked by the dominant discourse: the importance of the psychocultural—as opposed to material—aspects of youth aspirations, and the numerous limitations on youth imposed by governance and structural

conditions. The argument is not that these oversights explain everything, but that the reductionism of the dominant discourse renders our understanding of youth, peace, and conflict incomplete. These oversights have significant implications for scholarship, for the practical challenges of peacebuilding, and for the futures of youth in Nairobi and beyond.

The first part of the study explains the focus on Nairobi and describes the research design. The second part reviews the literature related to the dominant discourse that focuses on the commonality of education and job programs targeted at youth peacebuilding, the simple and consistent logic underlying them, and studies of their effectiveness. The third part presents findings related to youth aspirations and agency. The fourth part discusses the two main shortcomings of the dominant discourse as reflected by field research. The conclusion summarizes the ideas that are overlooked by the dominant discourse and explores why and to what effect such oversight occurs, presenting, finally, a research and programming agenda.

Case Selection and Research Methods

Nairobi is a particularly suitable place in which to investigate questions of youth, conflict, and peacebuilding programming for at least three reasons. First, Kenya has a very youthful population, with a median age of just 19. "Kenyans under 30 comprise more than 70 percent of the population and 43 percent of Kenya's population is younger than 15" (DfID 2018, 5; Kenya National Assembly 2010b, 26). Although just 11 percent of Kenya's youth population currently lives in the capital, the United Nations predicts that the global number of youth living in cities will rise dramatically in the next 15 years and notes that, if current trends continue, "the plight of young people in cities is likely to be one of the main challenges of the Century" (Njonjo et al. 2011, 56). Second, in the past decade, Kenya has seen multiple forms of unrest, for which youth are often blamed. Youth are reported to have comprised 70 percent of the participants in the 2007–2008 postelection violence (EDC 2009); there are repeated concerns about the radicalization of Muslim Kenyan youth by al-Shabaab[1] (ICG 2012, 2014; Meleagrou-Hitchens 2013); and violent youth gangs appear to be on the rise in urban centers. Finally, Kenyan policymakers and international organizations working in the country routinely prescribe

[1] Harakat al-Shabaab al-Mujahideen (al-Shabaab) is the militant group based in Somalia, whose name literally means Mujahideen Youth Movement or Movement of Striving Youth.

education and subsequent jobs as the solution that will turn "the reality of the youth menace…[into] the greatest resource…of this country" (Kenya National Assembly 2010b, 28). The government also notes the importance of developing "a sustainable program to create jobs in this country and get the youths of this country properly employed and engaged" as a strategy to prevent youth from being recruited by al-Shabaab, as well as to circumvent participation in youth gangs (Kenya National Assembly 2010c, 25–28).

This study is based on six principal sources gathered with the help of two Kenyan research assistants between June 2013 and October 2014: (1) a survey of 233 in-school youth; (2) 40 qualitative interviews with a subset of the in-school youth; (3) 18 interviews with principals and teachers from the same schools; (4) 40 qualitative interviews with out-of-school youth; (5) nearly two dozen interviews with representatives from nongovernmental organizations (NGOs) and the government who are involved with youth issues; and (6) six focus groups from four participating schools and with two groups of out-of-school youth. While age brackets for youth differ by definition (for example, the United Nations focuses on ages 15–24, the Government of Kenya on ages 18–35), this study focuses on youth in their late teens.

The Human Development Index puts Kenya in the low-development category, ranking it 145 out of 187 countries (UNDP 2015). Forty-three percent of the Kenyan population lives below the poverty line of purchasing power parity (PPP) US$1.25 per day (Malik 2013). There are more than 70 ethnic groups, with five principal groups accounting for approximately 70 percent of Kenyans, and a political system that has consistently privileged some groups over others. In order to vary the socioeconomic, ethnic, and other background factors of participants, I purposively selected six secondary schools, as illustrated in Table 11.1. The latter two schools were both located in slums (over 60 percent of Nairobi's population lives in slums; Oketch and Mutisya 2012; UNESCO 2011). In each high school, a school official chose one form-four (final year) class to participate in a written survey on themes related to aspirations, education, and day-to-day attitudes and behaviors. Students in form four are on the brink of graduating and entering the adult world, or continuing their education, which places them in a unique position to reflect upon the themes of interest.

In these six schools, we collected survey data from 233 participants. We then used the surveys to purposively select five male and five female

Table 11.1 Schools in sample

School	*1*	*2*	*3*	*4*	*5*	*6*
Tuition (in KSh)[a]	90,000	98,000	140,000[b]	85,000	11,000	23,000
Type	National boarding school	National boarding school	National boarding school	National boarding school	Private church-run day school	District day school
Gender	Boys	Girls	Boys	Girls	Mixed	Mixed
No. of one-on-one interviews	5	5	5	5	10	10

Source: Author's construction

[a]US$1 = KES100 (Kenyan Shilling)

[b]Students receive significant scholarships based on merit. Kenya Certificate of Primary Education (KCPE) scores for this school are consequently higher

students from each school to participate in a total of 40 in-depth, one-on-one interviews, varying factors such as demographic and socioeconomic background, school achievement, and civic engagement to access a cross-section of the different circumstances that characterize youth experiences in Nairobi. The sample demographics are summarized in Table 11.2. Using snowball sampling, we also spoke with 40 out-of-school youth whose demographics are summarized in Table 11.3. These youths were concentrated in the slums around two schools in our sample. About a third had dropped out after primary school, another third had completed a few years of secondary school, and roughly one-third had finished secondary school but had no prospects for continuing their studies. Nearly all of the out-of-school youth told us that lack of funds explained their being out of school.

I also interviewed more than two dozen representatives from NGOs, bilateral agencies, and government ministries involved in youth-related issues to elicit their understandings of challenges and opportunities for youth in Kenya.

Finally, I presented the preliminary results to four focus groups in the participating schools (different form-four students than those who had participated in the interviews, since the members of original sample had already moved on) and two focus groups of available participants from the

Table 11.2 Descriptive statistics of in-school youth sample for interviews

Characteristics	*Male*	*Female*	*Total*
Age:			
15–17	7	9	16
18–19	10	10	20
20+	3	1	4
Total	20	20	40
Ethnicity:			
Kalenjin	1	0	1
Kamba	3	3	6
Kikuyu	2	7	9
Luhya	2	2	4
Luo	4	2	6
Other	8	6	14
Total	20	20	40
KCPE scores:[a]			
200–249	0	1	1
250–299	0	4	4
300–349	6	4	10
350–399	4	6	10
400–450	9	6	15
Total	19	21	40
School tuition:			
KES11,000	5	5	10
KES23,000	5	5	10
KES85,000	0	5	5
KES90,000	5	0	5
KES98,000	0	5	5
KES140,000	5	0	5
Total	20	20	40
Funds for food:			
Never lacking	9	4	13
Sometimes lacking	10	15	25
Often lacking	0	1	1
No response	1	0	1
Total	20	20	40

Source: Author's construction
[a]Kenya Certificate of Primary Education = KCPE

out-of-school interviews. The focus groups also served as an opportunity for youth to help explain and interpret the preliminary findings.

One limitation of these approaches is the likelihood of social desirability bias. In order to minimize potential bias and increase the comfort levels of the participants, all interviews were one-on-one. Most interviews with

Table 11.3 Descriptive statistics for out-of-school youth sample

Characteristics	*Male*	*Female*	*Total*
Age:			
15–17	0	5	5
18–19	10	6	16
20+	11	7	18
Unknown	0	1	1
Total	21	19	40
Ethnicity:			
Kalenjin	0	0	0
Kamba	1	3	4
Kikuyu	7	6	13
Luhya	4	6	10
Luo	6	3	9
Other	3	1	4
Total	21	19	40
Last year of school completed:			
Standard 8	7	4	11
Form 1	0	3	3
Form 2	5	2	7
From 3	1	3	4
Form 4	8	7	15
Total	21	19	40

Source: Author's construction

youth were undertaken by one of two youthful research assistants of the same gender as the youth participant and in the language of the participant's choice (English, Kiswahili, and/or Sheng).[2] I conducted five interviews with male participants and five with females, all of whom were comfortable in English, as well as all of the organizational and governmental interviews. We communicated clearly that we were not engaging in programming, only research, in an effort to minimize efforts to impress us. With out-of-school youth, we tried to build rapport and trust via snowball sampling from known organizations and individuals. We have remained in touch with a number of participants and continue to engage in informal discussions with them. To the extent possible, in both surveys and interviews, we asked questions related to negative attitudes and behaviors about other youth, rather than about the participants themselves.

[2] Sheng is a language used by youth, especially in urban slums in Nairobi, combining Swahili and English.

The Dominant Discourse: Youth, Conflict, and Youth Programming in Conflict-Affected Contexts

Education and employment programs are common strategies deployed with the aim of deterring youth participation in violence. Indeed, education and training are becoming the most common youth-targeted programs in conflict-affected countries (Olenik and Takyi-Lerea 2013). Likewise, employment programs are consistently identified as a top strategy (World Bank 2009; Creative Associates International and International Peace and Security Institute 2016). International aid organizations continue to expand both types of programs. For example, from 2000 to 2010, the World Bank increased its investments in youth-targeted initiatives 15-fold (World Bank 2010). While the end goals of such programming vary, there is often little variation in design; education and jobs are believed to be effective measures to deter youth from political violence, rebellion, violent extremism, and civil war (Monaghan and King 2016).[3] While scholars often carefully distinguish between these variables, in practice, the international aid community often refers to these outcomes interchangeably.

Education and employment programming are consistent with the scholarly literature on youth and conflict, which commonly attributes the correlation between youth bulges and various forms of violence to low opportunity costs among youth (Collier et al. 2003; Collier and Hoeffler 2004). Although most youth do not engage in violence, when there are many young people in a society, youth are said to have a "comparative advantage" in violence, similar to the argument often made about the poor that "life is cheap." Youth's opportunity costs—the cost of participating in violence, compared with the value of the sacrificed next best alternative (not participating)—are said to be particularly low. The upshot is that educated (Fearon and Laitin 2003; Barakat and Urdal 2008) and/or employed youth (Berman et al. 2011; Izzi 2013) are busy with other activities and/or work and have, for the most part, too much to lose to engage in conflict or other acts of violence. As education and employment are both thought to raise opportunity costs, it makes them attractive as widespread programs across the international aid community (see, for instance, Dupuy 2008; Chaffin 2010; Mercy Corps 2011; Østby and Urdal 2011; World Bank 2011; Smith and Ellison 2012; IMF 2015). Interviews with representatives

[3] Although it bears warning that unequal distribution of such educational opportunities can underlie conflict.

of NGOs, bilateral organizations, and the Kenyan government also echoed the same narrative. Nearly every interviewee discussed education and jobs as the solutions to getting youth onto prosocial pathways. Notably, each interviewee referred to youth as "idle," in explaining why youth involve themselves in conflict. And, as such, in explaining these initiatives, many interviewees invoked the logic of opportunity costs. For example, as one representative of an international NGO explained, "A lot of young people who participated in violence are [a] vulnerable group. They don't have much education…which may then really limit opportunities for them, and makes them take an attitude of [having] nothing to lose." Of course, the existence of the dominant discourse does not mean that all actors in the international aid community are identical and equally committed to the programs and logics presented here. Yet, reliance on this simplified narrative is a widespread practice of "Aidland" or "Peaceland" (Autesserre 2014).

Moreover, as discussed in the introduction, the commonality of the dominant discourse is not matched by evidence of program effectiveness. As Blattman and Ralston (2015, i) put it, referring to employment programming as an aim of stability, it is "based first on faith, second on theory, and last on evidence." The same is true of education for peace, with governments, aid agencies, and scholars facing an "absence of robust evidence" and still seeking to "understand what works best among various practices and program interventions" (Burde et al. 2015, v, 12). Many explanations for the disappointing results have to do with programmatic elements: inadequate access to education, poor quality education, a lack of long-term vision, unpredictable funding cycles, an inadequate understanding of the local economy and labor needs, inadequate attention to increasing demands, as opposed to youth employability, and/or poor targeting of those most at risk (Beasley 2009; Chaffin 2010; Izzi 2013). As Ian Spears (2012) writes:

> When efforts at building peace have failed, the assumption is made that there has been a problem in terms of implementation or method…. So the international community continues to advocate the same practices but recommends starting sooner and allowing for longer time frames, being more proactive, being more inclusive, being freer of other countries and their meddling ways, involving more of the community, and being more educated and informed.
>
> All of these may be worthy endeavours…. it is not clear that more of anything will produce more favourable peacebuilding outcomes. (Spears 2012, 300)

Less common explanations target the more fundamental assumptions underlying such programming. These include that insurgency may not be as low-skilled an occupation as the logic presumes or that poor households typically have a "portfolio of work," as opposed to one job (Berman et al. 2011; Blattman et al. 2017).

This study focuses on yet another set of fundamental assumptions: the dominant discourse surrounding youth, education, and jobs continues to understand youth within a materialist, economic, or "human capital" framework.[4] Nevertheless, there are many aspects of youth attitudes and behaviors that cannot be explained in these ways (Cramer 2002; Frye 2012). Indeed, recent studies point beyond economic rationales for participation in various forms of violence to the importance of psychosocial motivations (Morris 2014; Mercy Corps 2015; Gilligan 2016; Blattman et al. 2017), and there has long been a debate over the relative merits of understanding such motivations as rooted in greed and/or grievance (Collier and Hoeffler 2004). While simple and reductionist narratives of the education–jobs–opportunity costs type are common in explaining violence in developing and conflict-affected contexts, they often lead to unintended consequences that may be counterproductive, or even detrimental, to peacebuilding (Autesserre 2012, 2014). It is thus important to focus on more localized and contextualized understandings of youth aspirations and lives and to bring more youth voices, still too often left out, into the conversation. This study endeavors to do both by drawing on qualitative methods that prioritize youth voices and by focusing on youth aspirations.

Youth Voices: Aspirations and Agency

There are relatively few studies in sub-Saharan Africa that seek to understand what it is that youth want and why they want it.[5] Nonetheless, the period of youth is widely understood as a crossroads or watershed in which difficult or important decisions must be made—not the least by youth themselves, as suggested by the words of an 18-year-old male student in Nairobi: "Youth is when you make your life or destroy it." While identity

[4] "Human capital concentrates on the agency of human beings—through skills and knowledge as well as effort—in augmenting production possibilities." (See an overview in Sen 2003, 35).

[5] Exceptions include Kritzinger (2002); Uvin (2009); Frye (2012), and Sommers (2012).

is constructed across one's life course, identity formation is an especially important component of youth. The transition to adulthood leads youth to seek connections and to "find their place in the world" (Erikson 1968; Guerra and Olenik 2013).

Aspirations are a key part of this process. Here, aspirations means hopes for the future, an individual's desire to attain status, an object, or a goal. Aspirations are multidimensional, with education and career most common among studies, but with youth also often developing aspirations in many other realms, such as environment, religion, and community (Hart 2012). Aspirations may be the same as or different from expectations; expectations are realistic estimates of one's ability to achieve one's aspirations (Howard et al. 2011). While aspirations typically develop at an earlier age, it is during the period of youth in which people expect their aspirations to begin to be actualized. Youth in their late teens, the age of focus in this study, may become increasingly pessimistic about their ability to achieve their hopes for the future (Armstrong and Crombie 2000). Indeed, in contrast to traditional accounts, where youth was seen as a clear, transitional, and linear phase between childhood and adulthood—during which young people typically completed their education, got secure jobs, got married, and had children—scholars are increasingly describing youth, especially in the developing world and across Africa, as a prolonged, or even permanent, period of "waithood" (Singerman 2007; Honwana 2012).

Despite the many challenges of youth and "waithood" today, a host of studies show that youth, the world over, have high aspirations and are optimistic about the likelihood of achieving them. Most of these studies are from the United States and the United Kingdom, but they also represent such places as Burundi (Uvin 2009), Malawi (Frye 2012); and Tanzania (Nalkur 2009), which are consistently among the poorest countries in the world and in the bottom 40 on the Human Development Index (UNDP 2015).

Youth in Kenya, too, have very high aspirations, although "youth" need to be disaggregated, and there are some important variations (see Sommers 2015). For instance, the surveys and interviews with secondary school students illustrate important educational aspirations. In an open-ended question asking students in the final year of secondary school to list their hopes for the future, the most common answer was to successfully complete secondary education, with the aspiration of going to university as the second most common choice. No clear socioeconomic patterns

emerged; even among those who experience various forms of economic hardship, such as regularly not having enough money to buy food and/or to buy school supplies, like pens and notebooks, they aspired to university degrees, including master's degrees and PhDs. Likewise, there were no statistically significant differences between ethnic groups. Girls, however, had higher future schooling aspirations than boys.[6] Out-of-school youth generally shared in-school youth's high regard for education, noting the importance and power of education in bringing about social mobility. More than a third of out-of-school respondents, who had discontinued their education at different stages, named education as their top aspiration. Some out-of-school youth wanted to finish high school, some wanted to go on to university, while others wanted to take a course related to furthering their job opportunities. In terms of careers, the in-school youth who participated in this study aspired to high salary, high prestige, and formal sector positions that typically require not only university degrees, but postbaccalaureate degrees as well. In response to the question "What kind of job would you like to have?" the top four target occupations, in order, were engineer, doctor, "a well-paying job," and lawyer. Again, socioeconomic background did not make a clear difference in aspirations, although gender did. Eleven boys, but only one girl, for instance, aspired to be engineers, while twice as many girls as boys wanted to be lawyers. More girls than boys also aspired to be medical doctors or surgeons.

There were again both important similarities and key differences in the job aspirations of out-of-school youth, as compared to those who are in school. The most frequent responses to the question about career aspirations, in order, were business professional, nurse, and (tied for third) athlete, doctor, engineer, and lawyer. Other jobs that out-of-school youth mentioned included actor, chef, coach, computer professional, fashion designer, editor, entrepreneur, and journalist. Many out-of-school youth were more modest in their income goals and more specific in the personal and family needs that would be met with their earned incomes than in-school youth. Very few of the out-of-school cohort spoke about living a high standard of life or being rich. The humblest aspiration we heard across all interviews was from an out-of-school youth who aspired to a "decent job," which he defined as "one where you earn a legitimate wage, not something clandestine." Although there was more variation among

[6] A one-tailed t-test comparing aspirations for the level of education of girls ($N = 118$) to boys ($N = 114$) was significant at a 0.05 significance level.

this group than among the in-school youth, out-of-school youth, too, aspire—and do so unprompted—to higher-earning, prestigious, formal sector positions that require significantly more education than they have.

Every in-school youth that we interviewed, as well as all but three of the 40 out-of-school youths with whom we spoke, believed that s/he would achieve her or his aspirations. For many, it was difficult to even imagine not reaching them, as if it were sacrilege or tempting fate to discuss the possibility. Even when we asked some participants about whether they thought that coming from a poor background or being a woman could prevent them from reaching their goals, we typically received responses like this one from a woman living and attending school in a Nairobi slum: "No. If you believe you can, you can." The in-school youth who participated in the survey (recall there was no survey for out-of-school youth) asserted strong agency and the belief that they could shape their own lives. Their survey responses suggest a strong sense of self-efficacy: the vast majority (217/233, 93 percent) "agree strongly" that they are "able to improve my own life"; "agree" or "agree strongly" that when they see a problem in their neighborhood, they can help fix it (197/233, 85 percent); and "agree" or "agree strongly" that "if Kenya is on the wrong track, I believe I can do something to help my country" (193/233, 83 percent).

Many interviewees, both in schools and out, described, in the face of challenges, other youth despair. Several participants explained, for example, that youth turn to drugs or even commit suicide after failing exams because of hopelessness and a sense of failure. Raising issues directly related to peace and conflict, many talked about how failure to reach aspirations makes youth susceptible to mobilization by politicians seeking to abuse youth. Two interviewees talked about how youth who do not meet their aspirations are likelier to join al-Shabaab. Part of these responses may in fact be about the responders themselves, responding in ways that engage in self-promoting bias. Yet, it was also marked that nearly every interviewee espoused that s/he was different and many said that they would "never lose hope," displaying an optimistic bias (Harris 1996).

In discussing possible failures to reach aspirations, youth often blamed themselves and believed that their personal characteristics are what either hold them back or enable them to triumph. Consistent with prominent explanations for aspiration–achievement mismatches in US-based sociological literature, Nairobi youth appeared to have bought into ideologies of meritocracy and individualism epitomized by the "American dream"

and rags-to-riches stories. They believed in the possibility of upward mobility and were convinced that, despite challenges, "hard work and talent bring a just reward" (Sawhill and Morton 2007, 2). Also, consistent with explanations in the US-based literature, our study participants viewed education as the best means for achieving upward mobility.[7] As Silva shows, for instance, in her study of working class adulthood in the United States, youth often see themselves as the principal barrier to their own success, as opposed to such factors as unexpected economic or social shocks and racism, "cling[ing] so fiercely to neoliberal ideals of untrammelled individualism and self-reliance" (Silva 2013, 25). Although nearly all participants' responses indicated that they have a plan to achieve their success, most youth, both in- and out-of-school, of both genders, and from different socioeconomic backgrounds, were very vague on the details of such plans. Most youth referred only to traits in responding to the details of their particular plans, such as "work hard and have determination"; "being positive in everything I do"; and "trusting in God."

There are both consistencies and inconsistencies with the dominant discourse that arises from these interviews with youth. Consistent with the dominant discourse presented above, youth highly value formal education. This does not mean that they found the education system in Kenya to be perfect—they had multiple complaints—but they had strongly embraced the instrumental value of education. They further placed high value on jobs. Also, consistently, youth's aspirations were, in part, driven by material concerns. As one boy told us in a statement representative of many, "In the future I hope to achieve in terms of my career to enable me to live a sustainable life, without any suffering or I can be able to fend for my family to put food on the table, such a life [in which] I can afford something." Yet, while material concerns certainly underlay many of our conversations with youth, it was not generally what youth themselves chose to speak about. This suggests that the dominant discourse—focusing on education and jobs for predominantly material reasons—is too simple and reductionist; it may be fundamentally overlooking important components of what matters to youth.

[7] Paradoxically, for instance, studies show that African American students, who experience the gravest challenges to social mobility and have lower academic achievement, often most strongly view education as the key to upward social and economic mobility (Mickelson 1990).

Complicating the Dominant Discourse

Youth Aspirations and Identity in Nairobi

In the context of "waithood," where youth struggle to find their place in society, it is a critical oversight of the dominant discourse that what youth appear to want is not only, and perhaps not predominantly, material. Youth aspire to find a meaningful identity and place in society. Indeed, their desire for social connectedness emerged strongly in the interviews. While education and jobs were consistently raised as important aspirations, rather than understanding the motivations for these aspirations as only material, a psychocultural interpretation offers a more complete understanding of why youth hold these aspirations, a nuance that may lead to different policy prescriptions.

Youth who participated in this research were motivated very much in their aspirations by the desire to be respected and to improve their social status. For example, rather than speak about the material value of education, participants repeatedly explained that having had to "toil" in school is one of the hallmarks of respect. As one focus group suggested, imagining the situation of a very rich man who did not pursue his studies far enough, "The way people look at you, it still matters. People still look at you like he is very rich, but he didn't quite go to school and do a meaningful course…. People still look down on you, even if they look up to you on money." Likewise, even simply being in school granted a measure of status and allowed youth to imagine themselves as having prestige. Motivations underlying career choice were similar and perhaps stronger, as "Work has [long] remained *the* defining role identity of most people" (Goyder 2009, 3). As one respondent in a focus group of out-of-school youth explained in response to my query as to why most youth aspire to their careers of choice, "Respect—people will care about you and know you are someone. You are identified with that job." Another noted the pride and reverence with which people refer to certain careers—"My cousin is a doctor"—and aspired to this praise.

Youth were generally equally motivated by a desire to find an important place in their communities. The desire of participants to give back to Kenya, to their neighborhoods and communities, was strikingly common, and additionally functioned as the motivation for their aspirations. Being seen as someone able to help others is important to positive valuations of self-identity. Those who had received scholarships or other help to get

through schooling or employment training programs recognized the importance of "giving back" as well. When we discussed the purported importance of community service in focus groups, ideas of Kenyan or African brotherhood often emerged, as well as references to Christianity. Another line of reasoning involved remembering one's roots and wanting to help people avoid the hardships one had experienced. In our survey of in-school youth, most students identified "help[ing] improve the lives of others" as the best definition of success for their futures ($N = 146/229$), compared to earning lots of money ($N = 19/229$); being able to take care of parents, siblings, spouses, and/or children ($N = 20/229$); and other answers ($N = 21/229$).[8] Many espoused the aspiration of becoming a role model for their communities.

It appeared in this research that simply maintaining these aspirations was also important to youth, making the analytical concept of "aspirational identity" useful. An "aspirational identity" provides a narrative that allows "an individual [to] construe him or herself as one who is earnestly desirous of being a particular kind of person and self-consciously and consistently in pursuit of the objective" (Thornborrow and Brown 2009, 355; see also, Markus and Nurius 1986). Individuals imagine future versions of themselves, "possible selves," that represent their hopes, fears, and identities. As Swartz, Harding, and De Lannoy (2012) explained in the South African context, and equally applicable among the Nairobi youth who participated in this study, youth "deal in dreams," and aspirations have a "survival value."

Two examples, among many, illustrate this phenomenon among youth in Nairobi. Whereas government and NGO representatives commonly referred to youth, especially those who are out-of-school, as "idle," out-of-school youth themselves usually described their situation as one of "tarmacking," or less commonly, "hustling." "Tarmacking" refers to someone, usually with an education, "hitting the pavement" in search of a job. In contrast to sitting still or idling, tarmacking is an active verb suggesting

[8] Some respondents, in contrast, highlighted the instrumental value in "giving back." Among some of the wealthiest respondents, we heard things like, "If you don't help others, they also bring you down. They will steal and break into your house. If you have a plantation…and you don't live there and you don't give, the people will steal from you and they'll bring you down." As others explained, you need to give back so that people don't try to steal from you or make life hard for you. Still others suggested that it was "wise" to help those in need in order to get God's blessings.

forward movement. Tarmacking also contrasts with the more permanent state of "hustling" (piecing together odd jobs, making money any way you can), suggesting a transitional, temporary phase on the way to something better. In a focus group activity in which youth were asked to place a set of 10 occupations against a nine-point prestige scale (an adaptation of Nakao and Treas 1994), youth consistently placed tarmacking as having a higher social standing than hustling. This exercise often led to heated debates about whether or not tarmacking—seen by some as endeavoring to follow one's dreams—should have a higher or lower social standing than actually holding a job in an occupation deemed "beneath" one's aspirations. In a different example, and standing out among all interviews in Nairobi, one young man spoke about the importance of "false hope" in motivating young people to work through the difficulties of daily life. "If poor people didn't have that," he said, "everyone would commit suicide."

While some participants thought the country valued its youth as the "leaders of tomorrow," many complained that youth are the victims of overgeneralized, negative perceptions. One boy enrolled in a top Nairobi school said, "They think of us as selfish, arrogant people who can cause trouble and can be manipulated easily, because once you get the leader of these small circles of people, it is like you have everyone." An out-of-school youth explained that youth are often considered "bad people" that others try to avoid. Participants did not always think this was undeserved—many spoke of peer pressure influencing them to engage in negative behaviors, like drugs and alcohol, stealing, and mugging. Nonetheless, they saw negative stereotypes of youth as a recurring challenge (one that those in power, to be discussed in the next section, have incentive to reinforce).

The desire for belonging and respect, and other identity-related factors that underlie youth aspirations, suggest important limitations of the dominant, material-focused theories of change that drive youth programming in conflict-affected contexts. The importance of self-identity and social connectedness are increasingly cited as the motivations for certain types of political violence and need to be considered in meaningful peacebuilding responses (Morris 2014; Mercy Corps 2015; Gilligan 2016; Blattman et al. 2017). The aspirations of youth and the underlying reasoning for their aspirations speak to the importance of addressing the psychosocial needs of youth in peacebuilding programming.

Governance and Structural Constraints

The dominant discourse also sidesteps many governance and structural constraints that youth raised in interviews and that characterize the reality of the Kenyan landscape (and that of many other countries as well). Cramer (2002, 1855) explained that in such "methodologically individualist models of conflict [and peacebuilding], there are…problems deriving from the *failure* to incorporate the social, or to embed the economic and individual in the social, relational and historical."

Some of the challenges referenced by the participants are related to issues that education and employment programs are meant to address. According to the most recently available figures, while the primary Gross Enrollment Rate (GER) in Kenya is 101 percent, secondary GER drops to 41 percent (Glennerster et al. 2011; UNESCO 2011).[9] Yet, as an out-of-school female summarized, "If you are not in school, I most times feel not good, because those who are in school are working hard to change their lives, but with me, I'm not." Recall that education was often itself an aspiration and otherwise instrumentally crucial to the fulfillment of career aspirations of most youth with whom we spoke. In addition, the majority of Kenyan youth are unemployed, underemployed, or underpaid (Njonjo 2010), and this was a major concern among youth, NGO representatives, and government officials with whom I spoke. Perhaps 40 percent of Kenyan youth are unemployed, and 80 percent of all Kenya's 2.3 million unemployed are youth (Oketch and Mutisya 2012). Whereas most jobs to which youth aspired require postsecondary education, tertiary GER is just 8–10 percent for men and 6 percent for women (UNESCO 2011). Poverty was a recurring challenge mentioned by interviewees, especially those living in Nairobi's slums; in one focus group, participants told me that "very few youth who live in the ghetto succeed." Participants repeatedly mentioned the related challenges of turning to drugs, alcohol, crime, gangs, and prostitution as ways to face and sometimes escape their poverty. In some ways, education and employment interventions could indeed help address these particular challenges.

Yet, many of the challenges that youth mentioned are left unaddressed by typical education and job programs. For example, corruption in both education and employment was cited frequently in interviews. Some youth

[9] Here is a good basic explanation of how this can be 101%: https://en.wikipedia.org/wiki/Gross_enrolment_ratio

complained that the children of ministers and their inner circles gained access to exams prior to the test and that public scholarships went to the rich. Equalizing access to education would be insufficient, however, according to participants: "You can have a degree, but you are working in *mjengo* [a construction site], because you do not have connections to go to or you don't have that money to bribe those people." Indeed, the young people emphasized the importance of having a "godfather" (someone who could help get you into the right circles) or being from the "right tribe." One participant explained the best piece of job advice he ever got, although he has not been able to put it to use due to lack of funds, was the importance of bribing hiring managers to recruit him. These concerns are well-founded: Transparency International (2015) scores Kenya 25 on its 100-point "corruption perceptions index" with 0 being highly corrupt. Linked to the importance of gaining respect mentioned previously, one focus group offered the idea that when you hold a respected job, people do not discriminate against you.

The participants also emphasized their societally subservient role to Kenyan elders and to government officials. They talked about how politicians and other powerful people try to manipulate them by offering them a little bit of money to take on dirty work. This practice was most evident during the 2007–2008 postelection violence, but the study participants believed that this was a more generalized tactic, and that powerful people universally seek to keep youth subservient. They frequently invoked the Kiswahili phrase, *kazi kwa vijana, pesa kwa wazee*, meaning that the youth do all the work, but the pay goes to elders influential with government. The phrase emerged from a well-known project, *Kazi kwa Vijana*, Kiswahili for "Jobs for the Youth," initiated by the Government of Kenya in 2009, and which was the World Bank's first public works program aimed at African youth. This program was intended to "turn the negative energies of youth into positive and constructive energies" (Office of the President 2011), by employing them in short-term public works, doing things like, at least in Nairobi, fixing roads and sewers. The youth with whom we spoke saw the program as insufficient—short-term, unskilled, low-prestige jobs—which further confirmed their prior beliefs, as the effort was tainted by government corruption (see also Kenya National Assembly 2010a, 35). Some of the participants recognized efforts in government policies. A few knew vaguely, for instance, about the provisions

for youth in the newly ratified Kenyan Constitution,[10] although they did not know the specifics and usually complained that the provisions are not acted upon. At the time of this writing, a new scandal was plaguing the government's Youth Development Fund (KTN News 2016).

The many challenges mentioned by these young people highlight the weight of governance and structural factors that are overlooked in the material focus and individuality of the dominant discourse. Youth programming focuses on the supply side—increasing youth access to education and/or youth employability, typically putting the locus of responsibility for change squarely on the shoulders of the youth themselves. These foci overlook the structural conditions that encourage corruption and other social injustices that are likely to hinder the success of youth peacebuilding programs. Many such constraints cannot be overcome with the current model of education or jobs that aim to fit youth into the status quo. Youth may be motivated to engage in violence for a desire to remedy perceived injustices and to change the status quo (see, for example, Gilligan 2016).

Charting a Research and Programming Agenda

The dominant logic in the current scholarship is two-fold: material motivations underlie youth participation in political violence, and education and jobs raise human capital in a way that makes it costlier to participate in conflict. This dominant logic has oriented peacebuilding policy and programming on the ground, yet evidence of effectiveness has not kept pace with enthusiasm. Understanding what is overlooked by the dominant discourse and why it is overlooked is crucial to building a research agenda in regard to youth and peace in Africa, as well as to actually designing youth-focused peacebuilding programs that address youth needs.

The dominant discourse is simple in its materialist approach and in its consequent assumptions about the interests and concerns of youth. Its simplicity is part of its success, as it has been readily accepted by the organizations concerned about youth violence. As Autesserre (2012, 207) wrote: "An uncomplicated story line, which builds on elements already

[10] Article 55 of the 2010 Kenyan Constitution states, "The State takes measures, including affirmative action programs, to ensure that the youth (a) access relevant education and training; (b) have opportunities to associate, be represented and participate in political, social, economic and other spheres of life; (c) access employment; and (d) are protected from harmful cultural practices and exploitation."

familiar to the general public, and a straightforward solution—is particularly important in enabling a narrative to achieve and maintain prominence." As a way to understand and address the "problem" of youth, a materialist lens that recommends providing more education and jobs (or training ostensibly leading to jobs) is relatively straightforward. Efforts can be measured quantitatively. This approach does not raise fundamental questions about the complexities of what youth want, why youth involve themselves in conflict, the purposes of education, or the place of youth in society. It does not fundamentally challenge power or existing social or political frameworks. It is, admittedly, much more difficult to think about concrete, implementable interventions that would help a broad spectrum of youth feel more connected to their identities and communities and/or that meaningfully challenge governance and social structures.

Including and prioritizing youth voices in research and policymaking is important in and of itself and may lead to a more holistic understanding of the needs and motivations of this demographic. In particular, two key challenges to the dominant discourse emerged from this in-depth research with youth: the importance of self-identity and community belongingness, and the challenging of governance and social structures. Both suggest further avenues of exploration for research and a revised approach to programming for youth peacebuilding interventions.

First, with a dearth of evidence regarding the effectiveness of education and job programs in fostering peace, this research suggests that programming is less likely to be successful if it does not engage with the aspirations and identities of youth. A number of recent NGO reports likewise attest to the importance of doing more to harness youth hopes and optimism (Mercy Corps 2015), but offer few suggestions in regard to the specific ways to do so. According to our interviews with young people, it is clear that current educational programs are not entirely wrong: youth do indeed desire education, and ultimately, jobs. Yet these programs also leave too much overlooked.

Borrowing Amartya Sen's terminology, "human capital" interventions—which concentrate on knowledge, skills, and effort in increasing productivity—are much easier than "human capabilities" interventions—that focus on the ability of human beings to "lead the kind of lives they value they have reason to value" (Sen 1999, 10). In response to questions about programming that youth themselves would like to see implemented, many of them advocated for mentorship. One possible avenue for research might examine interventions that focus on soft skills, such as grit, self-

regulation, mindsets, and implementation intentions (Gollwitzer 1999; Dweck 2006; Duckworth et al. 2007; Tough 2013; Steinberg 2014). Such interventions may help operationalize aspirations and offer a culturally embedded alternative to the dominant materialist focus. One promising study shows that, among criminally engaged Liberian men, training in noncognitive skills, including self-control and self-image, significantly reduced their involvement in crime and violence (Blattman et al. 2017).

Second, this research suggests that doing more to address the structural challenges that youth face could also improve programming and related research. These dimensions, too, are omitted from the dominant discourse. Education and job programs generally overlook the structural conditions that enable corruption and other social injustices. However difficult, addressing deep-rooted questions of governance cannot be sidestepped.

Third, building on this study of youth aspirations, further research is required to understand the links between youth aspirations and their attitudes and behaviors, especially as they relate to peace and conflict. In the context of the United States, researchers are beginning to explore the role of aspirations, optimism, and hope as potential mediators of a host of positive behaviors. Higher aspirations have been associated with a reduction in a variety of violent actions (Aspy et al. 2004; Howard et al. 2011; Stoddard et al. 2011; Bernat et al. 2012; Bernard et al. 2014). Then, equally important, more research is needed to understand how, under what conditions, and to what effect youth lose hope (Mains 2012; Sommers 2012). Unmet aspirations are increasingly cited in the youth and conflict literature as a driver for participation in violent conflict (McLean Hilker and Fraser 2009; Ray 2006), although with little empirical study.

The world population is currently comprised of the largest number of youth in history, and projections suggest that the "youth bulge" will never again be so large (Sommers 2015, 18). By 2020, there are projected to be 57 million more 15–24-year-olds in Arab states, south and west Asia, and sub-Saharan Africa. This youth cohort will require significant expansion of education and employment opportunities, simply to remain at current levels. The situation is particularly acute in Africa since, within two to three decades, three of every four countries with youth bulges will be in sub-Saharan Africa (Borton 2009; Njonjo et al. 2011; UNESCO 2012). In the next decade, Kenya is projected to move from a child-rich population to one dominated by youth. While the questions raised herein are globally pressing, they are of heightened relevance for Kenya and Africa.

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