

LSE

THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

LSE Research Online

Florence Crick, Elizabeth Gannon, Mamadou Diop and Momadou Sow

Enabling private sector adaptation to climate change in sub-Saharan Africa

**Article (Accepted version)
(Refereed)**

Original citation:

Crick, Florence and Gannon, Elizabeth and Diop, Mamadou and Sow, Momadou (2018) Enabling private sector adaptation to climate change in sub-Saharan Africa. [Wiley Interdisciplinary Reviews: Climate Change](#). ISSN 1757-7780
DOI: [10.1002/wcc.505](https://doi.org/10.1002/wcc.505)

© 2017 The Author

This version available at: <http://eprints.lse.ac.uk/85747/>
Available in LSE Research Online: November 2017

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (<http://eprints.lse.ac.uk>) of the LSE Research Online website.

This document is the author's final accepted version of the journal article. There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

Enabling private sector adaptation to climate change in sub-Saharan Africa

Florence Crick¹, Kate Elizabeth Gannon¹, Mamadou Diop² and Momadou Sow²

¹ Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, London, UK email: f.d.crick@lse.ac.uk

² Innovation Environnement Développement (IED) Afrique, Dakar, Senegal

Abstract

The private sector is increasingly recognised as having important potential to help society adapt and become more resilient to climate change. Yet there is limited research examining how to promote and facilitate private sector adaptation in developing countries and in particular how governments can create an enabling environment to stimulate and incentivise domestic private sector adaptation. In this paper, we address this gap through a review of the key factors required to provide an enabling environment for the private sector denoted by existing adaptation literatures. We do this with a focus on adaptation by small and medium enterprises (SMEs) in sub-Saharan Africa (SSA). To advance this review, we draw insights from a much larger, yet generally independent, literature on enabling environments for private sector development. This literature disaggregates the private sector and highlights key constraints to the development and growth of SMEs in SSA, including deficient infrastructure and evidence of an African gap in access to and use of finance. Both areas of scholarship are then combined in a framework identifying key ‘building blocks’ constituting enabling conditions for private sector adaptation. The framework could be applied in many ways including to focus strategies to enhance private sector adaptation and to identify trade-offs and interactions between policies or initiatives surrounding private sector development. By combining these literatures, we call for a more holistic approach to developing enabling environments for SME adaptation and climate resilient development, that addresses the broader structural deficits that condition vulnerability and barriers that limit adaptive capacity.

Graphical/Visual Abstract and Caption

Synthesis of adaptation and development literatures, exploring enabling environments for adaptation among SMEs in sub-Saharan Africa

Introduction

Climate change poses increasing risks to economic growth and development efforts across the world and effective adaptation will require the participation and inclusion of all actors in society¹. The role of the private sector in adaptation is gaining increasing policy attention within national² and international governance fora, with the United Nations explicitly calling for the private sector to engage in shaping and furthering global climate change adaptation and sustainable development agendas^{3,4,5,6}. Discussion, however, is often focused on what Pauw & Pegels² (p.258) describe as ‘the private sector *for* adaptation’. Given the high level of investment required to respond meaningfully to adaptation challenges, coupled with the limited public funds being mobilised, here the focus is on the private sector as a tool for resourcing adaptation and driving innovation to foster wider resilience.

Much less attention has been paid to examining how to promote and facilitate what Pauw & Pegels² label ‘domestic private sector adaptation’; i.e. the processes through which firms institute strategies to manage climate risk within their own operations. Defined by Avenchenkova et al¹ (p.520) as “the process of adjustment by companies to actual or expected climate and its effects through changes in business strategies, operations, practices and/or investment decisions”, private sector adaptation is particularly underexplored in developing countries, where climate change adaptation research has primarily focused on households and communities. This is a critical gap in research since, as the pillar

of most national economies, the private sector plays a fundamental role in developing countries' growth and livelihood activities. Overall, in Africa for example, the private sector generates two-thirds of the continent's investment, 75% of its economic output and 90% of its formal and informal employment^{2,7}. At a disaggregated country level, the picture remains largely the same.

Climate change will affect the private sector in a variety of ways. It may lead to new possibilities for people and businesses in developing countries, with opportunities to create new products and services, develop new markets and access new funding streams and finance mechanisms^{8,9}. However businesses will also be exposed to different risks, ranging from economy-wide risks to specific sectoral, industry or company-level risks¹⁰. The impacts can be both direct, including damage to infrastructure and disruption to production processes, and indirect through disruption to supply chains, and changes in regulation, product demand and business reputation^{10,11}.

To some extent businesses will respond to these impacts through self-interest and will adopt adaptation measures to reduce costs, manage their exposure to risks and minimise disruption to their operations¹². Adaptation strategies vary by sector, but examples of private sector adaptation measures commonly documented within the literature include installing flood protection measures, investing in infrastructure to protect assets and processes, investment within supply chains to secure supply availability, integrating climate risk management into business management practices, undertaking vulnerability risk assessments, moving locations and selecting suppliers based on their resilience profiles^{4,10,13-15}. Yet although awareness of climate risk is often high within the private sector^{10,14,15}, businesses implementing adaptation strategies remain in the minority¹⁶ and tend to be large corporations in developed countries, mainly within the insurance, agriculture and water sectors^{1,10}.

Moreover, businesses need to have the incentives, resources, knowledge and skills to adapt effectively to climate change¹⁷. And thus, while private sector actors in developing countries also adapt to changes in climate, uptake of what has been categorised as *sustainable adaptation strategies*, that seek to maintain business operations at existing levels, such as weather index crop or livestock insurance, or purchase of drought-resistant seeds, is still fairly low^{18,19}. Instead, firms may be drawn into *reactive coping strategies* at times of climate stress, such as distress sale of assets and making staff redundancies¹⁹⁻²¹. While such strategies may help businesses to cope in the short term, over time reductions in stock and production may prove counter-productive, further reducing the resources that firms have available to help them cope with future climate impacts. A second distinction in SME adaptive behaviour in relation to climate change can be made between *adaptation to current climate risks* (sustainable or reactive) and *anticipatory planning* for future climate change¹⁹. Yet even in developed economies, examples of adaptation based on future projections are rare^{10,22}.

The way in which governments can create an enabling environment to stimulate and incentivise sustainable, proactive domestic private sector adaptation has been particularly overlooked within existing literatures. Adapting to climate change is not simply a technical issue that can be resolved through large-scale investments in infrastructure or technology transfers. Rather it requires enabling policies and an appropriate institutional environment that supports individual participants in the private sector²³⁻²⁷. Emerging literature on private sector adaptation has identified some of the broad methods through which governments can support private sector climate change adaptation, such as the provision of climate information, adoption of sensible regulations and creation of appropriate economic incentives^{24,28}. However little work has specifically sought to identify key elements constituting an enabling environment for private sector adaptation and it is this gap that this paper begins to address.

The private sector adaptation literature to date has tended to focus on larger sized companies and those based in developed countries^{1,13,15,29}. This review meanwhile specifically considers factors constituting an enabling environment for small and medium enterprises (SMEs) in sub-Saharan Africa (SSA). The reasons for this are two-fold. Firstly, SSA is especially vulnerable to climate shocks for reasons ranging from the region's challenging climate, to its lower GDP per capita and less developed infrastructure, climate services and market mechanisms. SSA is therefore an adaptation priority. Secondly, 'the private sector' is a wide-ranging term that covers all types of formal and informal businesses, ranging from micro enterprises, such as local entrepreneurs and smallholder farmers, through to multinational companies (MNCs) operating at global scales. Not all businesses possess the same capacity to consider climate change within their operations or require the same type of support, or facilitating environment, to adapt to climate change^{30,31}. It is therefore important to disaggregate the private sector, rather than to treat it as a homogenous entity.

SMEs were selected for the review as they are considered highly vulnerable to climate change, to be amongst the most affected by extreme weather events and to typically have low adaptive capacity³²⁻³⁵. On the other hand, SMEs are often seen as being more flexible in their operations than larger companies, and so also present their own potential to respond to climate change. SMEs form a critical part of both developing and developed country economies and are fundamental to more inclusive and equitable development. They contribute to economic growth, provide most employment opportunities and are strongly integrated into communities³⁶⁻⁴⁰. SMEs also hold the potential to make an important contribution to female employment and the social integration of marginalised groups^{7,41}. Given their role in driving local development, as well as their ability to innovate and to build community resilience, SMEs are important drivers for societal adaptation and for realising the opportunities of climate change⁴⁰.

While little attention has been given to the question of how to provide an enabling environment for private sector adaptation, there is a more extensive literature on providing an enabling environment for private sector development more generally, which, as described by Byiers & Rosengren⁴², is "focused on developing country domestic economies and helping governments to design and implement policies to encourage economic transformation through investment, productivity growth, business expansion and employment" (p.5). To date this literature has remained largely disconnected from the private sector adaptation literature. Yet, as argued by Ackerman et al⁴³, adaptive capacity is "closely interconnected with other risks and vulnerabilities that accompany development and will be heavily constrained by local institutional and technological conditions" (p.77). Thus, echoing Trabacchi & Stadelmann²⁶, this paper assumes that an enabling environment for private sector adaptation requires general social and economic constraints and uncertainties experienced by SMEs to be addressed. We therefore anticipate key insights from the private sector development literature can inform research on private sector adaptation. By combining both areas of scholarship, this paper pursues a novel approach to reviewing the factors required to provide an enabling environment for private sector adaptation.

In its design, this review followed many of the processes that are expected of a systematic literature review. Sources of literature were identified through key word searches of electronic bibliographic databases, including Web of Science and Google Scholar. Abstracts and summaries were read, to preserve only the literature salient to our research. Papers were then read in more detail and appraised for their contribution to the research questions, before relevant data was extracted and summarised. Unlike a systematic review, however, in order to incorporate a wider range of practitioner perspectives, alongside these searches of bibliographic databases, we also extended our review to grey literatures, including reports, websites and policy documents. We did this through a snowballing technique, where we identified additional literatures from our existing corpus, and through other online search engines. Some additional documents were obtained through email or face-to-face contact with actors and institutions working in the field. Initially we explored the private

sector adaptation and private sector development literatures more generally. This focus was then narrowed down to literature considering Africa and then SMEs specifically.

The review is structured as follows. First the literature on private sector development is reviewed with a particular focus on identifying the structural barriers that SMEs in SSA face to their business development. Secondly, we review existing literatures on private sector adaptation to identify factors most relevant to SME adaptation. These areas of scholarship are then combined within an organising framework that attempts to integrate and represent the 'building blocks' of an enabling environment for climate resilient development and private sector adaptation. We close by suggesting that this framework could serve as an assessment tool to evaluate enabling environments for private sector adaptation within and across countries, as well as to support developing country governments, international agencies and donors in the identification of structural deficits and the definition of policy and intervention priorities.

PROVIDING AN ENABLING ENVIRONMENT FOR SME ADAPTATION IN SUB-SAHARAN AFRICA – WHAT CAN WE LEARN FROM THE PRIVATE SECTOR DEVELOPMENT LITERATURE?

Characteristics of SMEs in sub-Saharan Africa

Within the literature, definitions of SMEs vary widely. Although the majority of definitions focus on the number of employees and/or annual turnover of a business, they are not consistent across the literature and can vary significantly between countries⁴⁴. The World Bank's definition of 'small' (5-19 employees), 'medium' (20-99 employees) and 'large' businesses (>99 employees), utilised in the World Enterprise Survey, is perhaps the most widely employed for developing countries, with 'micro' enterprises accounting for those with fewer than 5 employees⁴⁵.

The private sector in SSA is generally characterised by a large number of micro and small enterprises, and a small number of medium and large enterprises. In Kenya, for example, conservative estimates suggest that there are 2.3 million SMEs (including micro enterprises), of which only 1% are of medium size⁴⁶ and, across SSA, micro and small enterprises are estimated to represent around 80% of total employment⁴⁰. This situation is termed the 'missing middle'. It arises because overall, the private sector in SSA suffers from several structural deficits including widespread and rising informality, lack of upward mobility of enterprises, weak inter-firm linkages, low levels of export competitiveness and a lack of innovation capabilities⁴⁷. As a result, very few micro or small enterprises manage to make the transition to medium-sized or large companies. The 'missing middle' creates an important disadvantage for the region, because medium or large firms tend to create the majority of higher quality and higher wage jobs and are considered key sources of innovation and economic diversification^{48,49}.

The informal sector is often conceptualised as small and unorganised producers on the fringe of the formal economy. However, across SSA, it is estimated that only 10% of SMEs, excluding microenterprises, are formal⁵⁰. The informal sector is especially dominant in rural areas and in the key economic sectors of agriculture, livestock and trade. There are disadvantages to operating informally, such as restricted access to finance, new market opportunities and public sector services^{51,52}. Yet businesses often face significant barriers to transitioning to formalisation^{50,53-57}. As a result, while this situation varies across the region, in Senegal, for example, some larger enterprises operate with a capital exceeding millions of West African CFA franc, but remain in the informal sector because of a poor business climate, which includes high taxes, high compliance costs and burdensome business regulations and reporting requirements⁵⁷.

Characteristics of an enabling environment for private sector development in sub-Saharan Africa

The accepted characteristics of an enabling environment for private sector growth and development have changed over time. Earlier research on private sector development typically recommended regulatory reform and reduced government intervention, focusing primarily on deregulation, property rights and the effective functioning of markets. Yet such approaches have proven insufficient^{47,58-63}, with over emphasis on the importance of regulatory reform, leading to public intervention being neglected and other constraints in the business environment being overlooked^{47,63}.

In more recent development literature, Bowen et al⁶⁴ identify nine features that are associated with sustainable, private sector-led growth and that are present in dynamic and fast-growing economies. These include: Natural capital, infrastructure, human capital, macroeconomic stability, institutional and regulatory frameworks, access to markets, access to capital, competitive markets and high firm performance. More specific factors identified in the development literature as key components of a business enabling environment include low levels of bureaucracy, simplified business registration procedures, labour regulation reforms, business development services, access to market information, access to investment capital and property titling^{47,49,58,65,66}.

The growing literature that is developing around the barriers that SMEs in SSA face to their operation and business development affords particular attention to evidence of an African gap in access to and use of finance, which is argued to present a major bottleneck for the emergence and growth of enterprise⁶⁶⁻⁶⁹. Using data from the World Bank's Enterprise Survey, Beck and Cull⁶⁷ found that more than 25% of firms in Africa rate the availability and cost of finance as their most important constraint. This is nearly twice the rate seen in firms elsewhere. Beck and Cull⁶⁷ additionally highlight lower use of financial services by companies inside Africa, as well as by smaller and younger companies. There is also evidence of the 'missing middle' when it comes to accessing finance for businesses in Africa. While micro enterprises can often access finance through microfinance⁷⁰ and personal loans, these types of credit sources are more limited for the more established, but yet still vulnerable, enterprises that fall outside of 'micro' industry and within the larger, 'small' and 'medium' enterprise classifications⁵¹. Large enterprises, on the other hand, particularly those within the formal sector, find it easier to access more formal bank loans.

Deficient infrastructure, including power, transportation, water and telecommunications, is generally understood to be another key constraint to the development and growth of formal and informal SMEs in Africa^{7,71,72}. This applies to SMEs in all areas, but is particularly salient for those in rural and remote regions, where the quality of service tends to be low and disruptions frequent and unpredictable⁷². Other key gaps in the business environment in SSA, which again particularly impact rural and remote regions, and which present particular challenges for SMEs involved in agribusiness, surround the lack of access to technology, knowledge and local, national and international markets⁷¹.

Recognising these challenges in the business environment, value chain analysis and improving access to service providers and input and output markets, has been increasingly recognised as a means of building climate resilience in SSA, particularly in agricultural sectors. In the East African livestock sector, for example, investment to support commercialisation of livestock production, vertical transformation and development of inter-firm linkages has been shown to have great potential to leverage a range of socio-economic development benefits, at the same time as reducing the vulnerability of pastoralists to climate change^{73,74}. Fattening lots, breeding businesses and processing facilities, for example, can improve the quality of livestock production and provide opportunities for a larger proportion of livestock to reach national and international markets; including during times of climatic stress. These forms of adaptation largely depend on market mechanisms and the establishment of inter-firm linkages among SMEs. Incentives are needed for private sector actors to

enter the necessary markets to provide these goods and services. Again, these incentives need to be coupled with supporting services such as financial and extension services, product marketing tools, transport and communication networks and appropriate market regulation (e.g. of feed quality)⁷³.

Alongside uneven performance in access to quality secondary education in SSA⁷⁵, SMEs in SSA also suffer from a lack of skilled labour, as well as low managerial, entrepreneurial and technical capacity^{76,77}. This is a crucial constraint since firm characteristics play a key role in driving SME growth and development. In their recent research, Hampel-Milagrosa et al⁴⁹ found that critical factors in the upgrading potential of micro and small firms to medium and large-sized enterprises included not only the overall quality of the business environment, but also specific entrepreneur and enterprise characteristics, including the gender, education, experience, social capital, ambition and risk-readiness of enterprise owners.

Bardasi et al⁷⁸, suggest that male and female-owned enterprises face very similar constraints in their business environment, but that some constraints, including crime, corruption, education levels and access to finance, affect female-owned enterprises more severely^{41,78-81}. In addition, traditional gender roles and associated discrimination that limit access to factors such as finance and land ownership can present significant additional barriers to entry into entrepreneurship for women⁸²⁻⁸⁴. As a result, female-owned enterprises tend to be confined to the informal sector, to micro enterprises with limited growth potential and to economic sectors that typically require less capital (e.g. agriculture, processing)^{50,55,76,78,85}. In the face of this structural exclusion, female entrepreneurs in SSA often rely on informal support groups and social networks, including table banking groups, to support business development^{86,87}. And these groups may also undertake a range of other activities with potential to increase the resilience of SMEs, such as the group purchase of inputs (e.g. drought-resilient seeds), initiating cooperatives and other common pool resource management initiatives, such as reforestation/afforestation and greenhouse farming⁸⁷.

Table 1 summarises the key factors influencing SME development identified in this review. Many of these factors, such as improved infrastructure, access to markets, financial and advisory services and training and research, echo factors identified to shape an enabling environment for the private sector more generally. In order to exploit the full economic and social potential of the SME sector and to realise climate resilient development ambitions in rural and remote areas, action to strengthen business enabling environments in these areas needs to identify ways to reach female-owned and informal SMEs.

Table 1. Summary of key factors identified from the literature to influence SME development.

Key Factors	Example Literature	
<i>Internal Factors</i>	<p>Enterprise characteristics Presence of skilled labour Managerial and technical capacity and skills Access to finance, as well as access to appropriate financial instruments for enterprises of different sizes Access to technology, knowledge and training Access to markets, especially beyond local markets, and market information</p>	<p>Altenburg & Von Drachenfels (2006)⁵⁸ APPG (2015)⁷¹ Beck & Cull (2014)⁶⁷ Hampel-Milagrosa et al (2015)⁴⁹</p>
	<p>Entrepreneur characteristics Age Gender Education level Experience Social capital Motivation Risk-taking ability of enterprise owner</p>	
<i>External Factors</i>	<p>Physical Business Environment High quality infrastructure with reliable transportation, telecommunication, power and water supply services Business development services and support systems</p>	<p>Altenburg & Von Drachenfels (2006)⁵⁸ AfDB (2013)⁷ APPG (2015)⁷¹ Hampel-Milagrosa et al (2015)⁴⁹</p>
	<p>Regulatory environment Institutional and regulatory frameworks Labour regulation reform Simplified business registration Property rights and titling</p>	

DRIVERS AND BARRIERS TO PRIVATE SECTOR AND SME ADAPTATION – WHAT DO WE KNOW FROM THE ADAPTATION LITERATURE?

As private sector adaptation gains increasing policy interest, a key question from a decision-making perspective is, ‘how can such adaptation be facilitated?’ Indeed crucially, reflecting wider national and development objectives, the question is moreover, ‘how can climate change adaptation be facilitated to enhance equitable private sector growth and to promote climate resilient development?’ Understanding what might drive and motivate the private sector to adapt to climate change is critical to beginning to empower policy makers to provide and support a favourable enabling environment for private sector adaptation.

General motives for private sector adaptation to climate change include keeping costs down, minimising disruption to production and services, maintaining or increasing value and profitability and improving capacity to do business^{1,10,88}. As described by Fankhauser²⁵, the underlying paradigm

of such private sector adaptation “is of economic agents that maximise their profits or welfare in the light of climatic risk” (p.10, see also Mendelsohn¹²). Market drivers therefore play a key role in private sector adaptation, as businesses may respond to changing demand, diversify their activities, develop new products and services, upgrade their business, adopt new technologies, access new markets and seize new business opportunities arising from climate change^{10,14,29}. This is seen in the heart of Senegal’s ‘peanut-basin’, for example, where dwindling harvests resulting from reduced rainfall, soil salinisation and land degradation have pushed some former farmers to abandon their agricultural activities, and to gather in small businesses, to pursue salt extraction and production, for export to other African countries^{89,90}.

Other examples of SMEs adapting to changing climates and introducing new, more climate resilient products into local and national markets exist. Street vendors, restaurants and even breweries in West Africa have been documented incorporating more drought-resistant cassava into their food and beverage production, for example⁹¹. Similarly, a brewery in Zimbabwe has developed new beer products that use more resilient red sorghum grains. And a sanitation company in Ghana has now redesigned pit latrines to position them above ground in flood-prone areas⁴⁰. Nevertheless, adaptation is influenced and inhibited by a range of other internal and external factors^{25,92}. In this section, we provide only a brief overview of these factors and focus on those most relevant to SMEs, since a recent and more extensive review of drivers and barriers to private sector adaptation can be found in Averchenkova et al¹. Key factors identified in this review to help enable effective adaptation among SMEs are summarised in Table 2.

Limited access to financial products and services, as outlined above, means SMEs often struggle to cover the high upfront capital costs of investing in both short- and long-term adaptation measures²⁶. Furthermore, the differences in time horizons between climate change impacts and business investment planning, alongside the need for quick returns and short term growth, also present key challenges²⁶. Indeed, businesses of all sizes face trade-offs between actions to optimise short-term growth and actions to reduce climate risk⁹³; while businesses’ short-term investment horizons can impact their willingness to invest in longer-term adaptation measures and to develop products and services to reduce climate impacts²⁶. This may be especially the case among businesses not currently experiencing high exposure to climate risk, for which the business case for investing in adaptation measures to protect themselves against future climate risk may be less apparent^{1,10,15}. Anticipatory adaptation planning also requires the ability to make long-term decisions under conditions of uncertainty, which many businesses find difficult even in their core operations⁹⁴.

Just as firm and entrepreneur characteristics are critical in influencing the growth, development and upgrade potential of SMEs, internal factors and capabilities within a company will also influence its willingness and ability to adapt to climate change^{10,26,30,94–100}. For example, key decision makers, such as business owners, or internal champions have important roles to play in identifying and communicating climate risks and opportunities, and in supporting adaptation decision making^{95,99}. Such champions are key, for example, in ensuring that business continuity or emergency preparedness plans and vulnerability assessment frameworks are put in place, to understand and manage long-term risks and opportunities from climate change. Yet adequate expertise for risk assessment and management is less likely to be found within micro, small and medium enterprises, compared to larger companies^{8,10,15,29,30,94}.

There is therefore a key role for government in supporting SME adaptation through business capacity building and information services. Governments and development partners could, for example, support adaptation by domestic private businesses through providing credible and easily accessible scientific information, through weather and climate services, through guidelines, models and tools and through co-financing research and developing new products and services^{3,10,15,24,88,101}. Surveys of SMEs in Gaborone, Lusaka and Nairobi, following the 2015-16 El Niño, for example, illustrate the

value of climate services, wherein 28% of SMEs surveyed noted that forecasts and other early warning systems helped their business to plan for El Niño associated water supply disruption, hydroelectric load shedding and flooding²¹. In this study, business managers described attempting to limit disruption through ex-ante changes to their business inventory, investment decisions, supply chains and savings behaviour; although notably other SMEs reported that other barriers to action limited the value of early-warnings.

Policies and regulatory and legal frameworks represent further critical external drivers that can stimulate or constrain private sector engagement^{1,10,43,93,101–103}. Low institutional capacity, poor business environments and policies and incentive structures that distort price signals (e.g. subsidies on certain seeds, fertilisers or irrigation water) can constrain the private sector's ability to respond to climate change risks^{10,26,101}. Indeed, many businesses are unable to overcome these types of structural barriers to adaptation⁹⁴; especially those in developing countries that already suffer from poor business enabling environments. By comparison, economic incentives may encourage SMEs to invest in climate resilience^{10,26,88,104} and subsidies and tax breaks can be employed by governments to encourage SMEs to adopt strategic adaptation responses. In 2015, the Zambian Energy Regulation Board, for example removed duty and fees on solar power products, following extensive national drought-induced hydroelectric load shedding, in an effort to increase private sector electricity production¹⁰⁵.

As our examples above illustrate, market drivers also play a role, as businesses can respond to changing demand, develop new products and services, access new markets and seize new business opportunities from climate change^{10,11,29}. This is particularly true for large companies, where there is evidence in several sectors, including agriculture, water, insurance and consulting sectors, that companies have recognised that adaptation represents a new business opportunity. For SMEs, such drivers may remain more limited if they do not have the right supporting environment to enable them to take advantage of opportunities, new markets and changing demand.

Table 2. Summary of key factors enabling SME adaptation identified from the literature.

Key Factors	Example Literature
<i>Internal Factors</i>	Presence of a climate change leader/champion within the business (not limited to the business owner); Internal capacity of business Climate change relevant knowledge/expertise and skills amongst employees Financial resources Access to data, knowledge and information Experience of climatic impacts or awareness of risks
<i>External Factors</i>	Legal and regulatory drivers to stimulate private sector adaptation Policies and incentive structures to engage private sector in climate change adaptation Economic and financial incentives to encourage and support private sector investment in climate resilience Market drivers that create new opportunities for the private sector from climate change

A role for multi-stakeholder partnerships?

This review suggests that SME adaptation requires multiple factors of enabling environments to be addressed in combination, in areas that are often lacking in SSA and that require the involvement of a diverse range of actors. Pathways to overcoming these multiple barriers in enabling environments and to implementing action to support SME adaptation are very sparsely treated within the literature, both practically and conceptually; signalling a priority area for future research¹⁰⁶. Nevertheless, emerging interest surrounds the model of multi-stakeholder partnerships (MSPs) for meeting the multifaceted challenges of adaptation¹⁰⁷, and this warrants consideration for enabling adaptation among SMEs.

Described under various labels, MSPs can operate at diverse scales, through different combinations of actors, and with varying formality^{108,109}. The language of ‘multi-stakeholder partnerships’, however, is frequently related to partnerships bringing together actors from the three main social sectors – government, the private sector and civil society – often with a public policy objective, such as climate change and/or development¹⁰⁷. This is reflected in the definition of partnerships offered by Van Huijstee et al¹¹⁰, who describe partnerships as “collaborative arrangements in which actors from two or more spheres of society (state, market and civil society) are involved in a non-hierarchical process, and through which these actors strive for a sustainability goal” (p.77).

MSPs present their own challenges as a model for structuring action to enable adaptation. Actors from different sectors – and indeed within sectors – have different agendas, priorities and ways of doing business, which may be difficult to reconcile¹. Setting up and maintaining effective partnerships can be very time costly¹¹¹. And key concerns have been raised around equity and power inequalities within partnerships, as well as around transparency and accountability^{109,112}. More broadly, the overall effectiveness of partnerships has also been called into question^{108,111}.

Nevertheless, the role that MSPs can play in supporting adaptation and climate resilient development represents an understudied area that warrants further exploration. This research gap is particularly salient to enabling environments for SME adaptation, since, as seen in this review, the factors required to enable SME adaptation are cross-cutting, spilling over the traditional remits and capabilities of any single sector, institution or actor. MSPs, meanwhile, appear to be a potential tool for coordinating action at multiple scales, and for developing more integrated and holistic approaches to addressing barriers within enabling environments. They offer the opportunity to bring stakeholders together, for the strengths of each sector to be harnessed, for knowledge, expertise and resources to be cross-leveraged and for regulatory, participatory, resource and learning gaps to be identified and addressed^{107,113}. In this way, rhetorically at least, MSPs also fit in with broader trends towards consultation^{108,111}, based on the recognition, that “increasing collaboration between different stakeholders will contribute significantly to a more resilient future”¹¹⁴.

There are a growing number of partnerships engaging in adaptation activities across SSA. The Planning for Resilience in East Africa through Policy, Adaptation, Research, and Economic Development (PREPARED) Project, is an example of such an MSP, that includes USAID, Jubilee Insurance, Kenya Meteorological Department (KMD), Rabobank and the United Nations Food and Agriculture Organisation (UNFAO). One of PREPARED’s activities involves piloting weather index insurance among SMEs who may otherwise lack a safety net in the event of climate shock¹¹⁵. The PREPARED partnership served as a forum to identify and articulate user needs, allowing partners in PREPARED to identify climate data quality issues as a core challenge for insurance companies; who struggle to access a robust index through which to determine commercially viable premiums for crop insurance^{116,117}. Partners have leveraged expertise within the partnership for capacity building within KMD, in order to facilitate greater investment in data. This has ultimately helped the partnership to take steps towards overcoming this resource gap within the business environment^{116,117}.

In another example of national governments working with development partners to assist businesses to build resilience to climate change, the ‘Coping with Drought and Climate Change in Zimbabwe’ initiative pursued a range of micro and small enterprise business development activities in the Chiredzi region, with the aim of diversifying the maize-based local economy, introducing adaptation measures to build climate resilience and reducing poverty⁴⁰. Among the initiative’s activities were demonstration plots, farmer field schools and other capacity building activities to increase farmers ability to pursue diversification strategies, improved soil moisture management approaches and more resilient mixed production models. Reflecting ongoing interest in the partnerships approach to adaptation, this project is now being built on through the ‘Scaling up Adaptation in Zimbabwe’ project implemented by Oxfam in partnership with Plan International, SAFIRE and the University of Zimbabwe¹¹⁸.

TOWARDS AN ASSESSMENT FRAMEWORK FOR ENABLING PRIVATE SECTOR ADAPTATION TO CLIMATE CHANGE IN SUB-SAHARAN AFRICA

This review has drawn from two fairly disparate literatures to identify key factors required to provide an enabling environment for business development, as well as the main barriers and drivers of private sector adaptation (Tables 1 and 2). We believe combining these literatures makes an important contribution for two main reasons. Firstly, while the private sector adaptation literature has tended to treat the private sector as a homogenous entity and has sought to identify drivers and barriers to adaptation in the private sector in general, the private sector development literature disaggregates the private sector, and thus makes space to develop greater insight into enabling conditions that are more directly relevant to SMEs. This is important given the unique potential of SMEs to contribute to more equitable climate resilient development.

Secondly, this paper has begun to reveal complex and multi-faceted interlinkages and synergies between the conditions required to promote SME development and adaptive capacity^{25,119}. Often SMEs in SSA not only lack the ability to adapt to climate change, but also face significant barriers to business growth. Yet some of the constraints that limit SME adaptive capacity also limit the general growth and development of SMEs. Both literatures highlight, for example, the role of technical and managerial capacity, a skilled workforce, economic incentives and access to finance, as well as regulatory frameworks, policies, institutional arrangements and market access. Measures to create an enabling environment for SME adaptation therefore hold the potential to also support broader climate resilient development. Meanwhile situating private sector adaptation within a broader exploration of the elements that are likely to enable climate resilient private sector development and growth, offers the opportunity to address the broader structural deficits and barriers that limit adaptive capacity and condition SME vulnerability. This is especially important in light of Tol & Yohe's¹²⁰ "weakest link" hypothesis, which suggests that adaptive capacity may be disproportionately influenced by the least developed aspects of enabling environments.

This review has additionally revealed factors that are considered more explicitly within one of the sets of literature examined and which are perhaps overlooked by the other. For example, the private sector adaptation literature emphasises the importance of access to climate information and expertise to enable businesses to undertake climate change vulnerability assessments and to plan for climate change impacts. The SME development literature meanwhile affords particular attention to the role of infrastructure and to enabling SMEs to build resilience through better access to local, national and international markets. It also provides a greater focus on the need for business development services and for capacity building and training more generally. In combination, these literatures make space for more holistic efforts to structure enabling environments for private sector adaptation; taking into account wider aspects of the business and policy environment, to address and remove structural barriers and enable adaptive capacity. With this aim, we end by presenting an organising framework that attempts to integrate and represent the 'building blocks' of an enabling environment for climate resilient development and private sector adaptation, as captured in existing literatures (summarised in Tables 1 and 2).

The framework presented is adapted from Stenek et al⁸⁸, who reviewed the private sector adaptation literature to build an index assessment framework around five key factors for influencing private sector adaptation, which they labelled 'Data and information', 'Institutional arrangements', 'Policies', 'Economic incentives' and 'Communication, technology and knowledge'. Many aspects of the adaptation literature (as summarised in Table 2) are captured by Stenek et al. For example, their framework stresses factors such as financing instruments and incentives to support private sector adaptation, as well as the importance of access to climate and hydrological data at a temporal and spatial resolution that is salient to business decision-making. In this way, the framework developed in Stenek et al takes an important first step towards conceptualising enabling environments for private sector adaptation and we found its key elements useful to help structure our framework. However, Stenek et al only seek to capture elements specific to private sector adaptation and thus our framework, presented in Figure 1, extends and adapts the work of Stenek et al through the integration of wider private sector development literature.

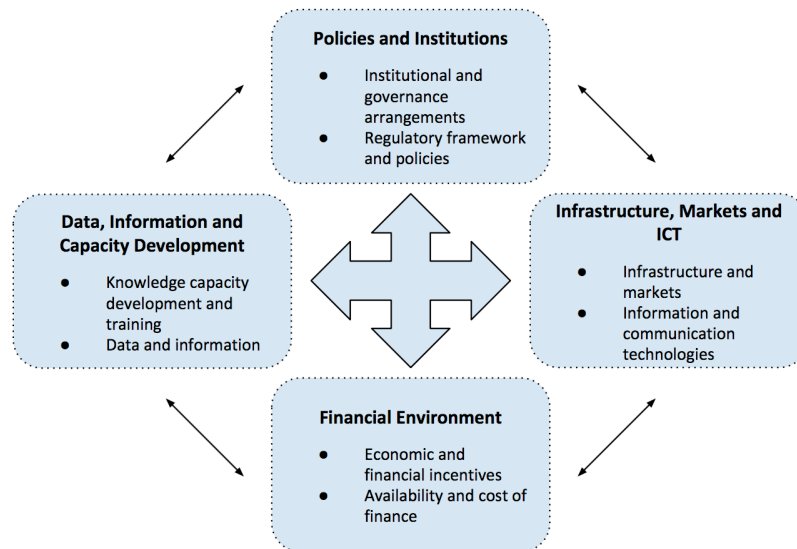


Figure 1: Core elements of an enabling environment for private sector adaptation and interlinkages across elements

The 'building blocks' for SME adaptation outlined in Figure 1 are inextricably and complexly linked. To offer one illustrative example of these linkages, having appropriate policies and institutions in place is a necessary condition for the development of climate data and information and the establishment of funds that can be accessed by the private sector. Connecting arrows in Figure 1 therefore represent interlinkages and dependencies between the different elements. Stenek et al constructed a set of indicators of enabling environments for private sector adaptation for each factor that they identified to influence private sector adaptation. The elements in Figure 1 are similarly dissected in Table 3, allowing the framework to serve as an organising mechanism that helps to break down the many interrelated factors of an enabling environment, characterised in existing literatures.

Table 3. Framework for an enabling environment for private sector and SME adaptation (adapted from Stenek et al⁸⁸)

INFLUENTIAL FACTORS		KEY ELEMENTS
POLICIES AND INSTITUTIONS	Institutional and governance arrangements	<ul style="list-style-type: none"> Climate change coordinating bodies/agencies at national and regional levels National and/or regional agencies/bodies supporting private sector development Multi-stakeholder or public-private partnerships (MSP/PPPs) to support climate change adaptation decision making Private sector multipliers – private sector associations/entities (e.g. chambers, business associations) Networks or consortia on climate change adaptation
	Regulatory framework and policies	<ul style="list-style-type: none"> Climate change adaptation policies at national and regional levels Building standards and/or codes incorporating climate change considerations Local zoning rules incorporating climate change considerations Private sector development policies Climate change considerations integrated into policies supporting development of private sector and/or SMEs
INFRASTRUCTURE, MARKETS AND ICT	Infrastructure and markets	<ul style="list-style-type: none"> Transportation infrastructure Water and electricity infrastructure Markets and business zones/centres Access to inputs, irrigation and new technologies Public and key infrastructure incorporating climate change considerations
	Information and communication technologies	<ul style="list-style-type: none"> Information and communication technologies Websites/online portals on climate change adaptation and market information
FINANCIAL ENVIRONMENT	Economic and financial incentives and affordable and accessible finance	<ul style="list-style-type: none"> Government incentives Finance instruments Climate and adaptation funds Insurance schemes
DATA, INFORMATION AND CAPACITY DEVELOPMENT	Knowledge, capacity development and training	<ul style="list-style-type: none"> Climate change adaptation training courses or programmes targeted at the private sector Research institutions or centres engaged in climate change research/work Forums/conferences on climate change Agricultural extension and training services Training and technology development centres Climate and hydrological observations, and early warning systems Seasonal weather forecasts Climate change projections
	Data and information	<ul style="list-style-type: none"> Data and information on direct and indirect impacts of climate change Information on, or case studies of, adaptation measures, costs and benefits Information on, or case studies of, community vulnerability, risk and adaptation Adaptation decision support tools and toolkits Standardised risk assessment tools for private sector

Adaptation requirements are locally contingent and adaptation planning requires extensive consultation to ensure that it is implemented in contextually appropriate ways. Thus, our framework must be understood as providing only broad categories of enabling conditions that themselves require scrutiny, consultation with local and situated actors and reflexive application. Nevertheless, we believe the framework could have broad applicability in efforts to cultivate an enabling environment for private sector adaptation, climate resilient development and SME growth.

Our expanded framework offers a coherent approach to exploring and understanding the complex inter-linkages between different broad elements of enabling environments, as reflected in the current knowledge base. To examine national provision for private sector adaptation through Infrastructure, Markets and ICT, for example, the framework calls for the consideration of access and reliability in electricity and water supplies, the presence of well-developed markets, as well as of business zones and centres that support market activities of enterprises; including export processing zones (EPZ). It calls for the evaluation of road infrastructure, ports and airports and the extent to which these facilitate transport and access to these key urban centres and markets. The framework also examines the extent to which public and key infrastructure incorporate climate change impacts and adaptation into their design, operations and decommissioning. And in relation to information and communication technologies, the framework demands consideration of the availability and market penetration of technologies such as mobile phones and the internet, including within rural areas. It considers the availability and usability of climate and adaptation information delivered through ICT's, (including websites and online portals), which are targeted at SMEs and the broader private sector, and which have relevance to specific geographical areas.

By combining key private sector development and adaptation elements and providing a description of how to examine the extent to which these elements are provided within a country, the framework could function as a general assessment tool: Offering a means through which to pursue a holistic, systematic and detailed evaluation of enabling environments for private sector adaptation within and across countries and to identify general strengths and weaknesses within business environments¹²¹. In addition to facilitating national evaluations and international comparisons, the framework could also serve as a guide through which to examine opportunities for developing country governments, international agencies and donors to focus strategies for enhancing private sector adaptation and to identify structural deficits and policy priorities. It might be helpful, for example, in the identification of trade-offs, conflicts and interactions, as well as overlaps and synergies between policies or initiatives surrounding private sector development and adaptation. New policy measures are not always needed and synergies with existing policies can be reinforced once they are identified. The identification of misalignments within existing regulatory frameworks and policies could also lead to revisions and advances in policy making¹⁰¹.

Our framework may initially seem more relevant for SMEs operating within the formal sector (e.g. the factors relating to institutional arrangements, regulatory framework and policies and financial incentives). However, many aspects of the framework are also relevant for informal SMEs, especially those relating to data and information, ICT, capacity development and training, in addition to some aspects of infrastructure and markets. Nevertheless, further research is required to better understand the specific constraints that informal SMEs in developing countries face in adapting to climate change. Since the literature on enabling environments for private sector and SME adaptation remains sparse, there is also much research still to be done with regards to expanding our understanding of how to support enabling environments more generally. Particular questions arise around how to strengthen engagement of SMEs in adaptation policy making, so as to develop policies and initiatives that better account for their specific needs and priorities. Moreover, SMEs in SSA operate in a difficult business environment, with multiple constraints on their growth and adaptive capacity^{122,123} and there remains strong disagreement regarding the relative importance of

the different factors that are required for SME adaptation. There is also disagreement surrounding how successful initiatives based on attempts to improve these conditions have been in the past^{27,42,47,58,65}. Research exploring SME adaptive management behaviour is particularly scant, but likely forms an important prerequisite.

This paper has called for an active role for governments in enabling private sector adaptation, yet we acknowledge that the state in developing countries can also present barriers to private sector development and adaptation. Measures such as distorting agricultural subsidies, for example, can have unintended adverse effects and exacerbate risks by discouraging action by businesses¹⁰¹. For this reason, in many developed countries, including the UK and Australia, national governments are trying to reduce their role in facilitating climate change adaptation and instead transferring responsibilities directly to local governments and the private sector.

Comparing these political trajectories however is likely to be unhelpful, as typically these countries already have fairly strong enabling environments for private sector development. To follow through with our examples, at the date of publication the UK and Australia sit at number 7 and number 15 respectively on the World Bank Doing Business project's 'ease of doing business' rank¹²⁴. Moreover, the business environment in these countries often includes many of the elements identified within this review as required to support business development and private sector adaptation; including national climate change adaptation policies, climate change projections, data and information on climate change impacts, adaptation decision support tools as well as standardised risk assessment tools for the private sector and climate change training courses targeted at businesses. By contrast, very few of these key elements are generally found in developing countries^{c.f.125}.

This review therefore echoes recent private sector development literature that has argued for a move away from strategies that rely on reduced government intervention and dependence on the principle of well-functioning markets^{47,58-63}, calling instead for more reflexive forms of public intervention^{25,47,49,58,63,66}.

Conclusion

SMEs, and the private sector at large, will play an increasing role in climate change adaptation over the next 10 years². However, the extent to which SMEs are able to meet the challenges and opportunities of climate change will depend in part on the way in which governments at local, national and international levels support an enabling environment for the private sector and for SMEs in particular. This paper has reviewed the literatures on private sector development and adaptation and, focusing particularly on SME adaptation, has synthesised these literatures into a framework that, while inevitably not comprehensive, identifies key 'building blocks' constituting enabling conditions for private sector adaptation. We have proposed this framework has wide potential application as an assessment tool for systematic examination of enabling conditions within and across countries, as well as a means through which to focus strategies to enhance private sector adaptation and to identify trade-offs and interactions between policies or initiatives.

Perhaps the foremost contribution of this framework, however, is that it rests on integrating literatures on private sector development and adaptation and demonstrates important interlinkages between the conditions required for climate resilient development and adaptation within the private sector. By combining the two literatures we have highlighted pathways for investment and development that show potential to simultaneously unlock SME adaptive capacity and business growth. This is fundamental since SMEs in SSA face multiple stressors and a range of obstacles in their business environment and adaptation is rarely undertaken in response to climate impacts alone¹²⁶. The synergies in enabling climate resilient private sector development highlighted in this paper may also serve as pathways to policy responses to enable private sector adaptation, among

policy makers who may otherwise struggle to reconcile actions to reduce longer-term climate risks with budget constraints, electoral cycles and the immediate demands of their constituencies. We anticipate the value of this more holistic approach to developing enabling environments for climate change adaptation to be particularly important for those SMEs which typically face additional barriers to their growth and development, such as those that are female-owned, rurally located or operate within the informal sector. This is important because creating enabling environments for private sector adaptation among all SMEs in developing countries will be fundamental to the quest for equitable and climate resilient development.

References

1. Averchenkova A, Crick F, Kocornik-Mina A, Leck H, Surminski S. Multinational and large national corporations and climate adaptation: are we asking the right questions? A review of current knowledge and a new research perspective. *Wiley Interdisciplinary Reviews: Climate Change*. 2016;7(4):517-536. doi:10.1002/wcc.402.
2. Pauw P, Pegels A. Private sector engagement in climate change adaptation in least developed countries: an exploration. *Climate and Development*. 2013;5(4):257-267. doi:10.1080/17565529.2013.826130.
3. United Nations Global Compact and UNEP. *Business and Climate Change Adaptation: Towards Resilient Companies and Communities*.; 2012. doi:10.1057/9781137302748.
4. United Nations Framework Convention on Climate Change (UNFCCC). UNFCCC Adaptation Private Sector Initiative. http://unfccc.int/adaptation/workstreams/nairobi_work_programme/items/4623.php. Accessed August 4, 2017.
5. UNISDR. *Global Assessment Report on Disaster Risk Reduction 2013. From Shared Risk to Shared Value: The Business Case for Disaster Risk Reduction*.; 2013. http://www.preventionweb.net/english/hyogo/gar/2013/en/home/GAR_2013/GAR_2013_2.html.
6. United Nations Conference on Trade and Development (UNCTD). *The Least Developed Countries Report 2014*. United Nations Publication; 2014.
7. African Development Bank Group (AfDB). *Supporting the Transformation of the Private Sector in Africa*.; 2013. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/2013-2017_-_Private_Sector_Development_Strategy.pdf.
8. Adaptation Sub-Committee (ASC). *Managing Climate Risks to Well-Being and the Economy*. London; 2014. https://www.theccc.org.uk/wp-content/uploads/2014/07/Final_ASC-2014_web-version.pdf.
9. Centre for Climate and Energy Solutions. *Adapting to Climate Change: A Business Approach*. Arlington, VA <https://www.c2es.org/docUploads/Business-Adaptation.pdf>.
10. Agrawala S, Carraro M, Kingsmill N, Lanzi E, Prudent-Richard G. Private Sector Engagement in Adaptation to Climate Change: Approaches to Managing Climate Risks. *OECD Environment Working Paper No 39*. 2011;(OECD Publishing). doi:10.1787/5kg221jkf1g7-en.
11. GIZ. *Private Sector Adaptation to Climate Change (PSACC): Factsheet Global Programme PSACC*.; 2015. <https://www.giz.de/fachexpertise/downloads/giz2015-en-private-sector-adaptation.pdf>.
12. Mendelsohn R. The Economics of Adaptation To Climate Change in Developing Countries. *Climate Change Economics*. 2012;3(2):1250006 (21 pages). doi:10.1142/S2010007812500066.
13. Tompkins EL, Adger WN, Boyd E, Nicholson-Cole S, Weatherhead K, Arnell N. Observed adaptation to climate change: UK evidence of transition to a well-adapting society. *Global Environmental Change*. 2010;20(4):627-635. doi:10.1016/j.gloenvcha.2010.05.001.
14. Carbon Disclosure Project. *Insights into Climate Change Adaptation by UK Companies: A Report Prepared for Defra by the Carbon Disclosure Project*.; 2012.
15. Crawford M, Seidel S. *Weathering the Storm: Building Business Resilience to Climate Change*.; 2013. <http://www.c2es.org/publications/weathering-storm-building-business-resilience-climate-change>.
16. Ipsos MORI. *Climate Change Adaptation: A Survey of Private, Public and Third Sector Organisations*.; 2010. randd.defra.gov.uk/Document.aspx?Document=GA0406_9458_FRP.pdf.
17. Fankhauser S, Smith JB, Tol RSJ. Weathering Climate Change: Some Simple Rules To Guide Climate Change Adaptation. *Ecological Economics*. 1999;30:67-78. <http://fnu.zmaw.de/fileadmin/fnu-files/publication/tol/ececadaptation.pdf>.

18. Mahul O, Stutley C. *Government Support to Agricultural Insurance: Challenges and Options for Developing Countries*. Washington DC: World Bank; 2010. doi:10.1596/978-0-8213-8217-2.
19. Crick F, Eskander S, Fankhauser S, Diop M. Adaptive capacity of SMEs, and (mal)adaptation to climate change: Evidence from Kenya and Senegal. (Forthcoming). *Grantham Research Institute on Climate Change and the Environment Working Paper Series*.
20. Shiferaw B, Tesfaye K, Kassie M, Abate T, Prasanna BM, Menkir A. Managing vulnerability to drought and enhancing livelihood resilience in sub-Saharan Africa: Technological, institutional and policy options. *Weather and Climate Extremes*. 2014;3:67-79. doi:10.1016/j.wace.2014.04.004.
21. Gannon KE, Conway D, Pardoe J, Batisani N, Ndiyoi M, Odada E, Olago D, Opere A, Kgosietsile S, Nyambe M, Omukuti J, Siderius C. Business experience of El Niño associated floods and drought in three cities in in sub-Saharan Africa. (Under review).
22. IPCC. *Climate Change 2007: Impacts, Adaptation and Vulnerability.*; 2007. http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4_wg2_full_report.pdf.
23. Bapna M, Mcgray H, Mock G, Withey L. Enabling Adaptation: Priorities for Supporting the Rural Poor in a Changing Climate. *World Resources Institute Issue Brief*. 2009. [pdf.wri.org/issue_brief_enabling_adaptation.pdf](http://www.wri.org/issue_brief_enabling_adaptation.pdf).
24. Biagini B, Miller A. Engaging the private sector in adaptation to climate change in developing countries: importance, status, and challenges. *Climate and Development*. 2013;5(3):242-252. doi:10.1080/17565529.2013.821053.
25. Fankhauser S. Adaptation to Climate Change. *Grantham Research Institute on Climate Change and the Environment, London School of Economics, Working Paper No 255*. 2016. <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/11/Working-Paper-255-Fankhauser.pdf>.
26. Trabacchi C, Stadelmann M. *Making Adaptation a Private Sector Business: Insights from the Pilot Program for Climate Resilience in Nepal.*; 2013. <https://climatepolicyinitiative.org/wp-content/uploads/2013/12/SGG-Case-Study-Pilot-Program-for-Climate-Resilience-in-Nepal.pdf>.
27. Pauw WP. Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries. *Climate Policy*. 2015;15(5):583-603. doi:10.1080/14693062.2014.953906.
28. International Finance Corporation (IFC). *A Strategy to Engage the Private Sector in Climate Change Adaptation in Bangladesh in Bangladesh.*; 2010. <http://www.asocam.org/biblioteca/files/original/bbbf4ef195646ac726be9666031b4b74.pdf>.
29. Pricewaterhouse Coopers (PWC). *Business Leadership on Climate Change Adaptation: Encouraging Engagement and Action.*; 2010. <http://www.pwcwebcast.co.uk/encouraging-engagement-and-action-full-report.pdf>.
30. Lonsdale KG, Gawith MJ, Johnstone K, Street RB, West CC, Brown AD. *Attributes of Well-Adapting Organisations.*; 2010. http://www.ukcip.org.uk/wp-content/PDFs/UKCIP_Well_adapting_organisations.pdf.
31. Pulver S, Benney T. Private-sector responses to climate change in the Global South. *WIREs Climate Change*. 2013;4(6):479-496. doi:10.1002/wcc.240.
32. Yoshida K, Deyle RE. Determinants of Small Business Hazard Mitigation. *Nature Hazards Review*. 2005;6(1). doi:10.1061/(ASCE)1527-6988(2005)6:1(1).
33. Runyan RC. Small businesses in the face of crisis: identifying barriers to recovery from a natural disaster. *Journal of Contingencies and Crisis Management*. 2006;14(1):12-26. doi:10.1111/j.1468-5973.2006.00477.x.
34. Wedawatta G, Ingirige B, Amaratunga D. Building up resilience of construction sector SMEs and their supply chains to extreme weather events. *International Journal of Strategic Property Management*. 2010;14(4):362-375. doi:10.3846/ijspm.2010.27.
35. AXA and UNEP. *BUSINESS UNUSUAL: Why the Climate Is Changing the Rules for Our Cities and SMEs.*; 2015. http://www.unepfi.org/psi/wp-content/uploads/2015/10/business_unusual.pdf.
36. International Finance Corporation (IFC). *2004 Annual Review: Small Business Activities.*; 2004. https://www.microfinancegateway.org/sites/default/files/mfg-en-paper-2004-annual-review-small-business-activities-2004_0.pdf.
37. Bacchetta M, Ekkehard E, Bustamente J. *Globalization and Informal Jobs in Developing Countries. A Joint Study of the International Labour Office and the Secretariat of the World Trade Organization*. Geneva, Switzerland; 2009. <http://www.oecd.org/site/tadicite/48133875.pdf>.
38. Dalberg. *Report on Support to SMEs in Developing Countries Through Financial Intermediaries*. Geneva, Switzerland; 2011. http://www.eib.org/attachments/dalberg_sme-briefing-paper.pdf.

39. Edinburgh Group. *Growing the Global Economy through SMEs.*; 2013. http://www.edinburgh-group.org/media/2776/edinburgh_group_research_-_growing_the_global_economy_through_smes.pdf.
40. Dougherty-Choux L, Terpstra P, Kammila S, Kurukulasuriya P. *Adapting from the Ground Up. Enabling Small Businesses in Developing Countries to Adapt to Climate Change, World Resources Institute and United Nations Development Programme.*; 2015. <http://www.wri.org/publication/adapting-from-the-ground-up>.
41. Welsh DHB, Melimi E, Kaciak E, Ahmed S. Sudanese Women Entrepreneurs. *Journal of Developmental Entrepreneurship*. 2013;18(2):1350013 (18 pages). doi:10.1142/S1084946713500131.
42. Byiers B, Rosengren A. *Common or Conflicting Interests? Reflections on the Private Sector (for) Development Agenda, Discussion Paper No. 131. European Centre for Development Policy Management.*; 2012. <http://ecdpm.org/publications/common-conflicting-interests-reflections-private-sector-development-agenda/>.
43. Ackerman F, Kozul-Wright R, Vos R. *Climate Protection and Development*. London: Bloomsbury Academic; 2012.
44. Kushnir K, Mirmulstein ML, Ramalho R. *Micro, Small and Medium Enterprises Around the World: How Many Are There, and What Affects the Count? MSME Country Indicators.*; 2010. <http://www.ifc.org/wps/wcm/connect/9ae1dd80495860d6a482b519583b6d16/MSME-CI-AnalysisNote.pdf?MOD=AJPERES>.
45. World Bank. Enterprise Survey and Indicator Surveys: Sampling Methodology. World Bank Group. http://www.enterprisesurveys.org/Methodology/~media/FPDKM/EnterpriseSurveys/Documents/Methodology/Sampling_Note.pdf. Published 2009. Accessed November 27, 2016.
46. Intelicap. *Closing The Gap Kenya: Update on Key Challenges for the "Missing Middle" in Kenya.*; 2015. [http://www.intelicap.com/sites/default/files/publications/26.10.15\(1\)_0.pdf](http://www.intelicap.com/sites/default/files/publications/26.10.15(1)_0.pdf).
47. United Nations Industrial Development Organization (UNIDO), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). *Creating an Enabling Environment for Private Sector Development in Sub-Saharan Africa.*; 2008. https://www.unido.org/fileadmin/user_media/Publications/documents/creating_an_enabling_environment_for_private_sector_development_in_subSaharan_Africa_01.pdf.
48. Collier P. Shifting aid to support business is the right decision. *Financial Times*. <https://www.ft.com/content/63f8341a-be22-11e6-8b45-b8b81dd5d080>. Published December 11, 2016.
49. Hampel-Milagrosa A, Loewe M, Reeg C. The Entrepreneur Makes a Difference: Evidence on MSE Upgrading Factors from Egypt, India, and the Philippines. *World Development*. 2015;66:118-130. doi:<http://dx.doi.org/10.1016/j.worlddev.2014.08.005>.
50. International Labour Organisation. Small and medium-sized enterprises and decent and productive employment creation. In: *Report IV. International Labour Conference, 104th Session.* ; 2015. http://ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_358294.pdf.
51. Fjose S, Grünfeld, Leo A, Green C. *SMEs and Growth in Sub-Saharan Africa: Identifying SME Roles and Obstacles to SME Growth*. MENON Business Economics Publication no. 14/2010; 2010. http://www.norfund.no/getfile.php/132385/Documents/Homepage/Reports_and_presentations/Studies_for_Norfund/SME_and_growth_MENON%5BFINAL%5D.pdf.
52. USAID. *Removing Barriers To Formalization: The Case for Reform and Emerging Best Practice.*; 2005. <https://www.oecd.org/dac/povertyreduction/38452590.pdf>.
53. Auriol E. *Barriers to Formal Entrepreneurship in Developing Countries.*; 2014. http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1352909193861/8936935-1356011448215/8986901-1380568255405/WDR14_bp_Barriers_to_formal_entrepreneurship_Auriol.pdf.
54. International Labour Organisation. *Engaging Informal Women Entrepreneurs in East Africa: Approaches to Greater Formality*. Geneva; 2015. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/briefingnote/wcms_430946.pdf.
55. International Labour Organisation. *The Informal Economy in Africa: Promoting Transition to Formality: Challenges and Strategies.*; 2009. http://www.ilo.org/emppolicy/pubs/WCMS_127814/lang-en/index.htm.
56. Sandada M. Transition From Informality to Formality: Perceptions of Informal Traders in The Harare Metropolitan Area. *International Journal of Economics, Commerce and Management*. 2014;2(12).

- <http://ijecm.co.uk/wp-content/uploads/2014/12/21218.pdf>.
57. Benjamin N, Mbaye AA. *The Informal Sector in Francophone Africa*. The World Bank and Agence Française de Développement; 2012. doi:10.1596/978-0-8213-9537-0.
 58. Altenburg T, Von Drachenfels C. The “New Minimalist Approach” to Private- Sector Development: A Critical Assessment. *Development Policy Review*. 2006;24(4):387-411. doi:10.1111/j.1467-7679.2006.00331.x.
 59. von Braun J, Keyzer M. *Global Action for Food Security*.; 2006. [http://www.sow.vu.nl/pdf/Brief food security.pdf](http://www.sow.vu.nl/pdf/Brief_food_security.pdf).
 60. Arruñada B. Pitfalls to avoid when measuring institutions: Is Doing Business damaging business? *Journal of Comparative Economics*. 2007;35(4):729-747. doi:<http://dx.doi.org/10.1016/j.jce.2007.08.003>.
 61. Durand-Lasserve A, Selod H. *The Formalization of Urban Land Tenure in Developing Countries*. Washington DC; 2007. http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1269364687916/6892589-1269394475210/durand_lasserve.pdf.
 62. Otto JM. Rule of law promotion, land tenure and poverty alleviation: questioning the assumptions of Hernando de Soto. *Hague Journal on the Rule of Law*. 2009;1(1):173-195.
 63. Lyons M, Brown A, Msoka C. Do Micro Enterprises Benefit from the “Doing Business” Reforms? The Case of Street-Vending in Tanzania. *Urban Studies*. 2013;51(8):1593-1612. doi:10.1177/0042098013497412.
 64. Bowen A, Cochrane S, Fankhauser S. Climate change, adaptation and economic growth. *Climatic Change*. 2012;113(2):95-106. doi:10.1007/s10584-011-0346-8.
 65. OECD. *Promoting SMEs for Development. 2nd OECD Conference of Ministers Responsible for Small and Medium-Sized Enterprises (SMEs). Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a More Responsible and Inclusive Globalisation*.; 2004. <http://www.oecd.org/cfe/smes/31919278.pdf>.
 66. OECD. *Business for Development. Fostering the Private Sector. A Development Centre Perspective*. Development Centre Perspectives Series Edition, OECD Publishing; 2007.
 67. Beck T, Cull R. *Small- and Medium-Sized Enterprise Finance in Africa. Africa Growth Initiative Working Paper 16*.; 2014. https://www.brookings.edu/wp-content/uploads/2016/06/SME-Finance-in-Africa-Designed_FINAL.pdf.
 68. Stein P, Hommes M, Pinar Ardic O. Closing the credit gap for formal and informal micro, small and medium enterprises. IFC advisory services. Access to finance. International Finance Corporation. 2013. <https://www.ifc.org/wps/wcm/connect/4d6e6400416896c09494b79e78015671/Closing+the+Credit+G+ap+Report-FinalLatest.pdf?MOD=AJPERES>.
 69. Quartey P, Turkson E, Abor JY, Iddrisu AM. Financing the growth of SMEs in Africa: What are the constraints to SME financing within ECOWAS? *Review of Development Finance*. 2017;7(1):18-28. doi:<https://doi.org/10.1016/j.rdf.2017.03.001>.
 70. Anane GK, Cobbinah PB, Manu JK. Sustainability of Small and Medium Scale Enterprises in Rural Ghana: the Role of Microfinance Institutions. *Asian Economic and Financial Review*. 2013;3(8):1003-1017. doi:10.3386/w19846.
 71. All-Party Parliamentary Group (APPG) on Agriculture and Food for Development. From subsistence to successful businesses: enabling smallholder agribusiness in sub-Saharan Africa. 2015. http://www.appg-agdev.co.uk/images/documents/APPG_AF4D_Smallholder_Agribusiness_Report_2015.pdf.
 72. Page J, Söderbom M. Is Small Beautiful? Small Enterprise, Aid and Employment in Africa. *African Development Review*. 2015;27(2012):44-55. doi:10.1111/1467-8268.12138.
 73. Carabine E, Lwasa S, Buyinza A, Nabaasa B. *Enhancing Climate Change Development Programmes in Uganda: Karamoja Livestock Value Chain Analysis for Resilience in Drylands*.; 2017. <https://www.odi.org/publications/10824-enhancing-climate-change-development-programmes-uganda>.
 74. Neely C, Bunning S, Wilkes A. *Review of Evidence on Drylands Pastoral Systems and Climate Change: Implications and Opportunities for Mitigation and Adaptation*. Rome: Food and Agriculture Organisation of the United Nations; 2009. http://www.fao.org/uploads/media/LWdisc_paper8_temp.pdf.
 75. United Nations Educational Scientific and Cultural Organisation (UNESCO). Regional overview: Sub-Saharan Africa. In: *EDUCATION FOR ALL 2000-2015: Achievements and Challenges*. EFA Global

- Monitoring Report.* ; 2015. http://en.unesco.org/gem-report/sites/gem-report/files/regional_overview_SSA_en.pdf.
76. Nkakleu R, Biboum A-D, Badiang A-B, Yamb B, Tidjani B, Diop F, Simen S, Ndiaye A. Accompagnement des Entrepreneurs et Performance Post Création des Petites Entreprises Camerounaises et Sénégalaises. *Rapport de Recherche du FR-CIEA*. 2013;N° 78/13.
 77. Robertson PL. The role of training and skilled labour in the success of SMEs in developing economies. *Education + Training*. 2003;45(8/9):461-473. doi:10.1108/00400910310508856.
 78. Bardasi E, Blackden CM, Guzman JC. Chapter 1.4 Gender, Entrepreneurship, and Competitiveness in Africa. In: *Africa Competitiveness Report.* ; 2007:69-85. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.497.4003&rep=rep1&type=pdf>.
 79. Brindley C. Barriers to women achieving their entrepreneurial potential. *International Journal of Entrepreneurial Behaviour and Research*. 2005;11(2):144-161.
 80. Singh G, Belwal R. Entrepreneurship and SMEs in Ethiopia: Evaluating the role, prospects and problems faced by women in this emergent sector Gurmeet. *Gender in Management: An International Journal*. 2008;23(2):120-136.
 81. Sow-Sar F. *L'entrepreneuriat Féminin Au Sénégal : Transformation Des Rapports de Pouvoir*. Paris, Montréal: L'Harmattan; 2010.
 82. Mugabi E. *Women's Entrepreneurship Development in Uganda : Insights and Recommendations*. International Labour Office. Geneva, Switzerland; 2014. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_360427.pdf.
 83. Mori N. *Women's Entrepreneurship Development in Tanzania: Insights and Recommendations*. International Labour Office. Geneva, Switzerland; 2014. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_360426.pdf.
 84. Desjardins S, St-Onge A. Les facteurs qui affectent les entreprises féminines : Perspectives de croissance. Le cas du Cameroun. Organisation internationale du Travail. 2009.
 85. OIT (Organisation Internationale du Travail). *Le Développement de L'entrepreneuriat Féminin.*; 2016. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_183754.pdf.
 86. Atela J. *The Politics of Agricultural Carbon Finance: The Case of the Kenya Agricultural Carbon Project*. STEPS Centre; 2012. <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/2213/The Politics of Agricultural Carbon Finance.pdf?sequence=1>.
 87. Atela J, Gannon KE. Climate change adaptation among female-led micro, small and medium enterprises in semi- arid areas: A case study from Kenya. In: Filho WL, Silva I da, Kalungu J, Musiyiwa K, Mugabe P, eds. *Climate Change Adaptation and Droughts Resilience in Africa: Building Resilience to Climate Change and Droughts in Africa*. Springer Climate Change Management Series. Forthcoming.
 88. Stenek V, Amado J-C, Greenall D. *Enabling Environment for Private Sector Adaptation - An Index Assessment Framework*, International Finance Corporation. International Finance Corporation; 2013. <http://www.ifc.org/wps/wcm/connect/6060670042bd92b6b297be0dc33b630b/Enabling+Environment+for+Private+Sector+Adaptation+-+Stenek,+Amado,+Greenall.pdf?MOD=AJPERES>.
 89. Faye P, Sambe ACD. Les relations de genre à propos du sel au Gandiole. *Les Etudes de cas de Negos-GRN*. 3(November). http://www.ipar.sn/IMG/pdf/Cas3_NEGOS_Sel_Gandiole.pdf.
 90. République du Sénégal. *PLAN CLIMAT TERRITORIAL INTEGRE: REGION DE FATICK.*; 2014. http://www.decentralisation.gouv.sn/sites/default/files/PCTI_FINAL_REGION_FATICK_20102014%281%29.pdf.
 91. Sanni LO, Onadipe OO, Ilona P, Mussagy MD, Abass A, Dixon AGO. *Successes and Challenges of Cassava Enterprises in West Africa: A Case Study of Nigeria, Bénin and Sierra Leone*. Nigeria; 2009. doi:10.1017/CBO9781107415324.004.
 92. Falco S Di, Veronesi M, Yesuf M. Does Adaptation to Climate Change Provide Food Security? A Micro-Perspective from Ethiopia. *American Journal of Agricultural Economics*. 2011;93(3):829-846. doi:10.1093/ajae/aar006.
 93. Surminski S. Private-sector adaptation to climate risk. *Nature Climate Change*. 2013;3(11):943-945. <http://dx.doi.org/10.1038/nclimate2040>.
 94. Ballard D, Bond C, Pyatt N, Lonsdale K, Whitman GP, Dessai S, Evans M, Tweed JH. PREPARE – Barriers and enablers to organisational and sectoral adaptive capacity – qualitative study. Part of the PREPARE Programme of research on preparedness, adaptation and risk. Final Report for project ERG1211 by Ricardo AEA for Defra. 2013. randd.defra.gov.uk/Document.aspx?Document=11255...Finalreport.pdf.
 95. United Nations Global Compact, UNEP, Oxfam, World Resources Institute. *Adapting for a Green*

- Economy : Companies, Communities and Climate Change.*; 2011. doi:10.1108/ijshe.2012.24913caa.009.
96. Berkhout F. Adaptation to climate change by organizations. *Wiley Interdisciplinary Reviews: Climate Change*. 2012;3(1):91-106. doi:10.1002/wcc.154.
 97. Hertin J, Berkhout F, Gann D, Barlow J. Climate change and the UK house building sector: perceptions, impacts and adaptive capacity. *Building Research & Information*. 2003;31(3-4):278-290. doi:10.1080/0961321032000097683.
 98. Galbreath J. To What Extent is Business Responding to Climate Change? Evidence from a Global Wine Producer. *Journal of Business Ethics*. 2011;104(3):421-432. doi:10.1007/s10551-011-0919-5.
 99. Linnenluecke MK, Griffiths A, Winn MI. Firm and industry adaptation to climate change: A review of climate adaptation studies in the business and management field. *WIREs Climate Change*. 2013;4(5):397-416. doi:10.1002/wcc.214.
 100. Pricewaterhouse Coopers (PWC). Stimulating private sector engagement and investment in building disaster resilience and climate change adaptation. Recommendations for public finance support. Final Report. 2013.
 101. OECD. *Climate Change Risks and Adaptation. Linking Policy and Economics*. Paris, France: OECD Publishing; 2015.
 102. Kivuitu M, Yambayamba K, Fox T. *How Can Corporate Social Responsibility Deliver in Africa? Insights from Kenya and Zambia. Perspectives on Corporate Responsibility for Environment and Development. Working Paper No 3.*; 2005. <http://pubs.iied.org/pdfs/16006IIED.pdf>.
 103. Ampaire EL, Jassogne L, Providence H, Acosta M, Twyman J, Winowiecki L, Asten P Van. Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda. *Environmental Science & Policy*. 2017;75:81-90. doi:10.1016/j.envsci.2017.05.013.
 104. Begum RA, Pereira JJ. The awareness, perception and motivational analysis of climate change and business perspectives in Malaysia. *Mitigation and Adaptation Strategies to Global Change*. 2015;20:361-370.
 105. Phiri C. ERB Waives Duty on Solar Products. *zambiareports.com*. <https://zambiareports.com/2015/07/21/erb-waives-duty-on-solar-products/>. Published July 21, 2015.
 106. Shackleton S, Ziervogel G, Sallu S, Gill T, Tschakert P. Why is socially-just climate change adaptation in sub-Saharan Africa so challenging ? A review of barriers identified from empirical cases. *WIREs Climate Change*. 2015;6:321-344. doi:10.1002/wcc.335.
 107. Pinkse J, Kolk A. Addressing the Climate Change--Sustainable Development Nexus: The Role of Multistakeholder Partnerships. *Business & Society*. 2012;51(1):176-210. doi:10.1177/0007650311427426.
 108. Surminski S, Leck H. *You Never Adapt Alone – the Role of Multi- Sectoral Partnerships in Addressing Urban Climate Risks Swenja Surminski and Hayley Leck March 2016 Centre for Climate Change Economics and Policy the Environment*. London; 2016. <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/03/Working-Paper-232-Surminski-and-Leck.pdf>.
 109. Selsky JW, Parker B. Cross-Sector Partnerships to Address Social Issues: Challenges to Theory and Practice. *Journal of Management*. 2005;31(6):849-873. doi:10.1177/0149206305279601.
 110. Van Huijstee M, Francken M, Leroy P. Partnerships for sustainable development: A review of current literature. *Environmental Sciences*. 2007;4(2):75-89. doi:10.1080/15693430701526336.
 111. McAllister RRJ, Taylor BM. Partnerships for sustainability governance: a synthesis of key themes. *Current Opinion in Environmental Sustainability*. 2015;12:86-90. doi:http://dx.doi.org/10.1016/j.cosust.2015.01.001.
 112. Bulkeley H, Newell P. *Governing Climate Change*. New York, NY: Routledge; 2010.
 113. Dyer J, Leventon J, Stringer L, Dougill A, Syampungani S, Nshimbi M, Chama F, Kafwifwi A. Partnership Models for Climate Compatible Development: Experiences from Zambia. *Resources*. 2013;2(1):1-25. doi:10.3390/resources2010001.
 114. Adaptation Futures. 4 Key Messages from Adaptation Futures 2016. <http://adaptationfutures2018.capetown>. Published 2018. Accessed August 3, 2017.
 115. Syroka J, Reinecke EB. Weather Index Insurance and Transforming Agriculture in Africa: Challenges and Opportunities. In: Background Paper. Feeding Africa: An Action Plan for African Agricultural Transformation; 2015. <http://includeplatform.net/knowledge-portal/weather-index-insurance-transforming-agriculture-africa-challenges-opportunities/>.
 116. SSG Advisors. Can Better Data Enhance the Climate Resilience of Small Holder Farmers? <http://ssg-advisors.com/can-better-data-enhance-climate-resilience-small-holder-farmers/>. Published 2016. Accessed March 27, 2017.

117. SSG Advisors. Smallholder Crop Insurance in East Africa: A New Way Forward. <https://ssg-advisors.com/smallholder-crop-insurance-east-africa-new-way-forward/>. Published 2016. Accessed August 4, 2017.
118. Climate Adaptation UNDP. Zimbabwe: Adapting Together: Working with Civil Society in Climate Change Adaptation. <https://undp-adaptation.exposure.co/zimbabwe-adapting-together>. Published 2016. Accessed November 7, 2017.
119. Fankhauser S, McDermott TKJ. Understanding the adaptation deficit: Why are poor countries more vulnerable to climate events than rich countries? *Global Environmental Change*. 2014;27(1):9-18. doi:10.1016/j.gloenvcha.2014.04.014.
120. Tol RSJ, Yohe GW. The weakest link hypothesis for adaptive capacity: An empirical test. *Global Environmental Change*. 2007;17(2):218-227. doi:10.1016/j.gloenvcha.2006.08.001.
121. Crick F, Diop M, Sow M, Diouf B, Diouf B, Muhwanga J. Enabling private sector adaptation in developing countries and their semi-arid regions – case studies of Senegal and Kenya. *Grantham Research Institute on Climate Change and the Environment Working Paper No 258*. 2016. <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/12/Working-Paper-258-Crick-et-al.pdf>.
122. Castells-Quintana D, Lopez-Uribe M, McDermott T. Coping with climate risk: the role of institutions, governance and finance in private adaptation decisions of the poor. *Grantham Research Institute on Climate Change and the Environment Working Paper*. 2015;(July). <http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/07/Working-Paper-200-Castells-Quintana-et-al.pdf>.
123. Lemma A, Jouanjean M, Darko E. Climate change, private sector and value chains: Constraints and adaptation strategies,. *Overseas Development Institute Working Paper*. (June 2015). <http://prise.odi.org/wp-content/uploads/2015/06/Climate-change-private-sector-and-value-chains.pdf>.
124. World Bank. Doing Business Project’s “Ease of Doing Business” Rank. <http://www.doingbusiness.org/rankings> [Accessed January 27, 2017]. Published 2016.
125. Burton I. Climate Change and the Adaptation Deficit. In: Schipper L, Burton I, eds. *The Earthscan Reader on Adaptation to Climate Change*. London: Earthscan; 2009.
126. Smit B, Wandel J. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*. 2006;16(3):282-292. doi:10.1016/j.gloenvcha.2006.03.008.

Acknowledgements

This work was carried out under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIIAA), with financial support from the UK Government’s Department for International Development (DfID) and the International Development Research Centre (IDRC), Canada. The views expressed in this work are those of the authors and do not necessarily represent those of DfID and IDRC or its Board of Governors. We also acknowledge financial support from the Grantham Foundation for the Protection of the Environment and the UK Economic and Social Research Council (ESRC) through the Centre for Climate Change Economics and Policy. The authors are grateful to Sam Fankhauser and Declan Conway (Grantham Research Institute on Climate Change and the Environment) for their very constructive comments on this paper and its earlier versions.

Further Reading

Averchenkova A, Crick F, Kocornik-Mina A, Leck H, Surminski S. Multinational and large national corporations and climate adaptation: are we asking the right questions? A review of current knowledge and a new research perspective. *Wiley Interdisciplinary Reviews: Climate Change*. 2016;7(4):517-536. doi:10.1002/wcc.402.

Fjose S, Grünfeld, Leo A, Green C. *SMEs and Growth in Sub-Saharan Africa: Identifying SME Roles and Obstacles to SME Growth*. MENON Business Economics Publication no. 14/2010; 2010.

[http://www.norfund.no/getfile.php/132385/Documents/Homepage/Reports and presentations/Studies for Norfund/SME and growth MENON %5BFINAL%5D.pdf](http://www.norfund.no/getfile.php/132385/Documents/Homepage/Reports%20and%20presentations/Studies%20for%20Norfund/SME%20and%20growth%20MENON%20FINAL.pdf).

Pauw P, Pegels A. Private sector engagement in climate change adaptation in least developed countries: an exploration. *Climate and Development*. 2013;5(4):257-267.
doi:10.1080/17565529.2013.826130.