Private adaptation in semi-arid lands: A tailored approach to ‘leave no one behind’

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Private adaptation in semi-arid lands: A tailored approach to ‘leave no one behind’

Non-Technical Summary
Globally, semi-arid lands (SALs) are home to approximately one billion people, including some of the poorest and least food secure. These regions will be among the hardest hit by the impacts of climate change. This article urges governments and their development partners to put SAL inhabitants and their activities at the heart of efforts to support adaptation and climate resilient development, identifying opportunities to capitalise on the knowledge, institutions, resources and practices of SAL populations in adaptation action.

Technical Summary
Semi-arid lands (SALs) in developing countries are climate change ‘hotspots’ where climate hazards will affect poor populations disproportionately. This represents a major threat to the 2030 Sustainable Development Agenda pledge to ‘leave no one behind’. In this paper we argue that national governments have underestimated opportunities to support climate resilient development in SALs and highlight ways in which the resilience of SAL populations has been undermined by current top-down approaches to adaptation and development. We argue a radical shift in national policy landscapes is required that re-focuses on leveraging the existing adaptive capacities of private actors – women, farmers, cooperatives and firms – to cope with and respond to prevailing environmental shocks and weather extremes. This, we argue, requires providing enabling business environments that are tailored to the diverse and specific needs of the private sector in SALs and which support the full range of private sector actors in SALs to meet the challenges and opportunities of climate change. In doing this, we identify opportunities to overcome structural weaknesses that currently contribute to a lack of private investment, undermine important resilience strategies and limit opportunities to unlock broader resilience in SALs through the private sector.

Social Media Summary
Unlocking the existing adaptive capacities of women, farmers and businesses in semi-arid areas is key to realising the SDGs.

Introduction
Semi-arid lands (SALs) in developing countries are high-risk climate change ‘hotspots’ (De Souza et al., 2015; Huang et al., 2016; Tucker et al., 2015). They occupy over 15% of the earth’s land surface (Safriel et al., 2005) and are home to approximately one billion people, including some of the poorest and least food secure (Middleton et al., 2011; Tucker et al., 2015). In Africa and Asia, these populations rely heavily on rain-fed agriculture, pastoralism and agricultural processing for their livelihoods, making them particularly exposed to climate and environmental variability. In addition, SALs in these regions are often remote, politically and economically marginalised areas that have limited access to markets, infrastructure and services (Middleton et al., 2011; Thorpe and Maestre, 2015; Tucker et al., 2015). Formal institutions and legal frameworks are typically underdeveloped, with land, water and other resource rights often insecure and unequally distributed.

Climate change will exacerbate the challenges faced by SALs, as global warming trends are expected to be particularly intense in these regions (Huang et al., 2016; IPCC, 2014), with droughts and floods already becoming more severe. This confluence of climate and non-climate risks, combined with broader socio-economic inequalities, means climate hazards will affect poor populations in SALs disproportionately. Yet to date SALs have been given limited attention in international climate policy. This represents a major threat to the pledge within the 2030 Sustainable Development Agenda to
'leave no one behind', and the Paris Agreement commitment to take into account the urgent and immediate needs of those that are particularly vulnerable to climate change.

In this paper we argue that national governments have underestimated opportunities for climate resilient development in SALs and we revisit and update literatures which highlight ways in which the adaptive capacity of SAL populations has been undermined by current adaptation and development policy and practice. In response, we call for a refocusing on approaches to supporting climate resilience in SALs that build on the opportunities of SALs and concentrate on leveraging the inherent adaptive capacities and flexibility of private actors – women, families, farmers and firms – to cope with and respond to prevailing environmental shocks and weather extremes. This, we argue, requires public provision of business enabling environments that support the full range of private sector actors in SALs to meet the challenges and opportunities of climate change.

Challenging existing development and adaptation policy and practice, we highlight opportunities to pursue a tailored approach to SAL adaptation, to open up more inclusive avenues of development (c.f. Manuel-Navarrete and Pelling, 2015; Pelling et al., 2015b). In so doing we identify opportunities to overcome some of the structural weaknesses that currently contribute to a lack of private investment, undermine important resilience strategies, hinder efforts to develop enabling conditions for private adaptation and limit opportunities to unlock broader resilience in SALs through the private sector.

Our analysis draws on five years of research conducted through the Pathways for Resilience in Semiarid Economies (PRISE) programme in seven developing countries across West and East Africa, and South and Central Asia, as well as on broader engagement with literatures on climate change adaptation and development policy and practice in SALs.

Existing resilience and adaptive capacity in SALs

SALs are sites of dynamic social, as well as environmental, change. They are characterised by existing adaptive capacities and flexibility within the strategies that households and businesses adopt in the context of climatic and environmental variability, to manage their exposure to risk and maximise their own welfare (de Jode, 2009; Hesse, 2011; Hesse et al., 2013; Mortimore et al., 2009; Mortimore and Adams, 1999). This flexibility in autonomous adaptation behavior (c.f. Fankhauser, 2016; Mendelsohn, 2012) can be seen in people adjusting and diversifying their livelihood strategies in response to the marked wet and dry seasons and the shifting availability of resources (Krätli, 2015). It can be seen in the heterogeneity of agricultural production systems and the prevalence of mixed farming systems. And it is frequently shaped by mobility and migration of humans and livestock and wildlife herds (Augustine, 2010; Behnke et al., 2011; Opiyo et al., 2015; Rain, 1999).

Pastoralists particularly have developed a diverse range of institutions and networks, as well as longstanding traditional strategies, characterised by mobility, flexibility and reciprocity, to manage the variability of resources in drylands and gain access to pasture and water (Bedelian and Ogutu, 2017; Hesse, 2011; Scoones, 1995). Indeed there is increasing evidence that, under the same conditions in climatically variable dryland environments, mobile and communal pastoralist systems may be more productive and resilient than sedentary and commercial ranch-based systems of livestock production (Behnke and Kerven, 2013; Behnke and Muthami, 2011; de Jode, 2009; Hesse et al., 2013; Hesse and Macgregor, 2009; Little et al., 2008; Rodriguez, 2008; Scoones, 1992). Other forms of internal or international and temporary or permanent human migration common to SALs, meanwhile, can make an important contribution to individual and societal adaptation. Migration may increase, as well as reduce, vulnerabilities (Hasan and Raza, 2009; Newborne and Gansaonré, 2017; Stapleton et al., 2017; Waldinger and Fankhauser, 2015). Yet, recent literatures reiterate the understanding that well planned migration can improve the resilience of rural households through livelihood diversification,
inflow of remittances, transfer of knowledge and skills, promotion of innovation and expansion of social networks (Hagen-Zanker et al., 2018; Krishnamurthy, 2012; Qaisrani et al., 2018; Salik et al., 2017; Scheffran et al., 2012; Sward and Codjoe, 2012; Wilkinson et al., 2018).

Recent research on the private sector in SALs has demonstrated ways in which micro, small and medium enterprises (MSMEs) are actively responding to climate risks, for example, by diversifying into different activities and taking up insurance or loans from financial institutions (Carabine and Simonet, 2018; Crick et al., 2018a; Eskander et al., 2018; Gannon et al., 2018a). Indeed, this research has shown that SAL businesses are not only highly aware of the current climate risks they face, but also, in some cases, are taking steps to prepare for future climate change (Crick et al., 2018a).

**Top-down development policies and erosion of SAL resilience**

Much of the economic and social dynamism and ingrained resilience that has evolved in SAL societies has been widely and continuously documented in academic and civil society literatures (Behnke et al., 1993; Catley et al., 2012; Hesse and MacGregor, 2006; Mortimore, 1989, 1998; Mortimore et al., 2009; Mortimore and Adams, 1999; Rain, 1999; Scoones, 1995). However, driven by typically centralised and top-down approaches to adaptation and development policy, national governments in developing countries have almost invariably failed to capitalise on the knowledge, institutions, skills and practices which underpin these existing adaptive capacities in SALs. Indeed, in many cases, the traditional institutions and livelihoods that have evolved to not only cope with, but also often to harness opportunities from, the climatic and environmental variability of SALs, have been actively undermined and destabilised by these policies.

As stated by Hesse, (2011), drylands policies in developing countries have tended to focus on bringing ‘stability’ and ‘order’ to environments viewed as unstable and disorganised and have sought to replace traditional land use and resource management practices with techniques seen as more ‘modern’. Narratives of resource scarcity and degradation, linked to conventional ecological equilibrium theory and notions of carrying capacity, for example have dominated policy and practice in SALs (Hesse, 2011; Mortimore et al., 2009; Scoones, 1995; Tiffen et al., 1994). This has led to popular misconceptions of pastoralism as backward, irrational and unproductive (Hesse and MacGregor, 2006; Jenet et al., 2016; Leach and Mearns, 1996; Swift, 2003). In addition, policy development in Africa’s SALs has had a long history of favouring agriculture over pastoralism and encouraging sedentarisation and the privatisation and commercialisation of pastoral land.

Opportunities for broader forms of human migration to function as resilience strategies have also been curtailed in SALs, by a tendency for national governments to continue to consider internal migration as a developmental concern that needs to be restricted. Pakistan, for example, has no domestic migration policy, exacerbating many of the structural barriers and vulnerabilities faced by SAL migrants (Saeed et al., 2016), and its climate change policy advocates limiting rural-urban population flows (Qaisrani and Salik, 2018). Other examples of large scale, centrally managed development strategies that have eroded or failed to recognise traditional resource management institutions and created new vulnerabilities and exacerbated degradation and conflict, have been widely documented in SALs, including in areas such as irrigation, forestry, land reform, livestock ranching, transportation infrastructure and natural resource extraction investments (e.g. Houdret, 2012; Mdee et al., 2014; Sandford, 2013; Söderbaum and Taylor, 2001; Weng et al., 2013, see also Hesse, 2011; Scoones and Wolmer, 2003).
An under-recognised private sector in SALs

Widespread missed opportunities for climate resilient economic development in SALs, have also been underpinned by failure to recognize the full range of economic actors and their economic potential within SALs.

At national levels, the dominant framing of SAL economies has been one of low productivity, vulnerability and unsustainable livelihoods. This framing has emphasised the aridity and climatic variability that characterises SALs, alongside limited access to ‘blue water’ in rivers and lakes to support irrigation, as major constraints to productivity (Jobbins et al., 2018). Representation of SALs as resource scarce, remote, landlocked and sparsely populated regions, with limited access to markets, has further enhanced the ‘bad geography’ narrative attached to SALs (ibid; Lemma et al., 2015). While these features are pertinent, they are not the whole story.

SAL economies make major contributions to national livelihoods and present significant additional opportunities for the development of national economies. Agricultural producers and pastoralists, are linked to large, and sometimes highly competitive, value chains spread across formal and informal sectors, incorporating a range of different sized businesses within and outside of SALs and exporting to domestic and international markets (Carabine and Simonet, 2018). There are opportunities across these key value chains to upgrade processing activities and to provide additional benefits to SAL and national economies, including enhanced employment opportunities (Bedelian et al., 2019; Carabine and Simonet, 2018). There is also increasing evidence that key value chains in SAL economies, such as the livestock sector in East Africa, have been grossly undervalued in terms of their contribution to national GDP (see for example Rodriguez, 2008; de Jode, 2009; Hesse and Macgregor, 2009; Behnke and Muthami, 2011; ICPALD, 2013; Carabine et al., 2017). Indeed, GDP itself may be a poor indicator of the potential and productivity found in drylands, where wealth is often held in assets, such as livestock.

The dominant discourse of SALs as unproductive has partly been able to dominate national development and adaptation policies, as the economic role and potential of the households, producers, and businesses – and their activities – in SALs have traditionally not been well recognised. This is mainly because: (1) economic actors operate largely at the level of agricultural producers and micro and small enterprises in the informal (unregistered) sector (Dougherty-Choux et al., 2015; International Labour Organisation, 2015); and (2) businesses, households and producers are often not clearly defined, static units, as producers businesses and households often engage in and move in and out of a range of different livelihood activities (Carabine and Simonet, 2018; Gannon et al., 2018b).

Within this landscape, SALs have suffered from long-term and disproportionate under-investment and political and economic marginalisation within national development agendas (Hesse, 2011; Jobbins et al., 2016; Mortimore et al., 2009), which in turn has broadly contributed to a lack of private investment. Where increasing investment has emerged in SALs, for example through foreign capital from countries such as China, it has often been focused on resource extraction and large-scale infrastructure and agriculture investments, which are typically detached from local livelihoods, have not produced the ‘trickle down’ benefits they purported to achieve and have often been accompanied by large-scale land grabs (Baxter et al., 2017; Borras et al., 2011; Deininger and Byerlee, 2011; Dzumbira et al., 2017).

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1 The textile sector in Pakistan, for example, based on cotton produced in the country’s SALs, is the largest industrial sector and accounts for around 40% of the country’s industrial labour force. Indeed, ten million people in Pakistan rely on the textile industry for employment (Batool and Saeed, 2018).
An under-provided for private sector in SALs

Where investments and policies have been made to support the private sector in SALs, a failure to recognize and account for the full range of private sector actors (and their multiple livelihood pathways) within their design, has also compromised opportunities to capitalize on the autonomous adaptation potential of SAL populations.

As described by Fankhauser, (2016: 10), the underlying paradigm of autonomous private sector adaptation “is of economic agents that maximize their profits or welfare in the light of climatic risk”. However, while Hesse (2011: 2) is undoubtedly right when he argues that “dryland people have much to teach us about living in an increasingly uncertain world”, SAL populations face very real structural and resource constraints which limit adaptive capacity (c.f. Cleaver, 2009, 1999). Existing adaptation strategies and behaviours employed to cope with immediate shocks and stresses in SALs are accordingly not all sustainable and will not all be sufficient to buffer against current or future shocks and stresses (see also Chambwera et al., 2015). Indeed, some autonomous adaptation strategies observed in SALs, such as diversification into environmentally destructive practices (e.g. deforestation linked to charcoal production), distress sales of land and other assets and the scaling back of production and workforces, are likely to reduce future adaptive capacity, result in private actors being drawn into risky activities that increase their vulnerability, degrade natural resource bases or transfer vulnerabilities along value chains (Atela et al., 2018; Batool and Saeed, 2018; Carabine and Simonet, 2018; Crick et al., 2018a; Rao et al., 2017). Current responses also do not necessarily take future climate risk into account, for example in the selection of new crops and production methods. And in some cases, changing climate parameters may undermine the viability of current livelihood strategies in more fundamental and perhaps inescapable ways.

Signaling a clear and strong role for public policy to support private actors to manage climate risk, research has nevertheless demonstrated that the ability of private sector actors to adapt effectively and sustainably to climate risk is strongly influenced by the external business enabling environment, in areas which are often lacking in SALs. Lack of access to finance, inappropriate incentive structures and limited access to markets and technologies (including climate smart inputs) are all factors that decrease the probability of firms engaging in sustainable adaptation actions, such as changing to climate resilient product mixes (Crick et al., 2018a). While access to tailored climate information services, information about adaptation options and general business support from public sources all increase the probability that businesses will engage in sustainable adaptation (ibid, see also Agrawala et al., 2011; Averchenkova et al., 2016; Chaudhury, 2018; Conway et al., 2019; Crawford and Seidel, 2013; Crick et al., 2018b; Davies, 2018; Dougherty-Choux et al., 2015; Stenek et al., 2013).

Sustainable private sector adaptation and climate-resilient development therefore requires many structural deficits within general business environments (such as limited access to markets, finance and transport and communication infrastructure) to be addressed, alongside conditions that support climate specific adaptive capacity (Carter et al., 2019; Crick et al., 2018a, 2018b). Such a holistic and multi-sectoral approach to supporting private sector adaptation is in itself a challenge since adaptation policy is often embedded within environment ministries (Pardoe et al., 2018), typically resulting in limited integration of (and capacity for) adaptation planning for the private sector within local and national development agencies.

Where climate change adaptation policies have given some consideration to private sector needs, they have generally promoted and recognized only a limited range of business and production models. Most notably, private sector adaptation policies have tended to focus primarily on the needs of larger and formal businesses, with less consideration given to smaller businesses, operating in the informal sector, which dominate the enterprise landscapes in SALs. Yet, informal enterprises, and those with more restricted access to formal land ownership, including women, mobile pastoralists and other
producers who farm land that is either communally owned or allocated through informal tenure (and thus who have little or no collateral), particularly struggle to access the support and especially the credit they require through formal channels (Atela et al., 2018; Batool and Saeed, 2018; Carabine and Simonet, 2018; Stein et al., 2013). Female entrepreneurs often face notable additional barriers to resource access and economic participation, shaped by strong sociocultural orientations around gender roles and resource use and access. However, the specific needs of women as economic actors have similarly often been overlooked, through blanket approaches to the design of enabling policies and programmes, hinged on linear assumptions of readily transferable technology that fail to reflect the context, motivations, and power structures in which actors take adaptation decisions (e.g. Atela et al., 2018 cf. Agarwal, 1994).

**Missed opportunities for building resilience in SALs through the private sector**

The failure to tailor public provision of enabling conditions for private sector adaptation and development to the diversity of private sector actors also risks further undermining adaptive capacities in SALs and means national governments and their development partners are likely to miss out on important opportunities to build and support SAL resilience.

Informality in the private sector in SALs, for example, reflects the heterogeneity of livelihood activities in SALs, as private actors move in and out of different market activities and adjust their livelihood strategies in response to stressors and the variability in drylands. In this way, despite structural disadvantages for informal businesses, including restricted access to new market opportunities and public-sector services, informality has even been described as “a key adaptive characteristic” to manage risks and variable resources in SALs (Carabine and Simonet, 2018: 24).

Smaller, informal and often women-led enterprises are also being overlooked in the dominant neo-liberal agenda on development via market-based interventions. Yet these actors too have the potential to make important and wide-ranging contributions to building resilience along key value chains and within communities. Formal and informal enterprises in SALs can, for example, support increased access to new inputs, technologies and services (including those which are climate smart), create new markets and provide local and non-agricultural employment opportunities (Carabine and Simonet, 2018; Gannon et al., 2018b).

Women involved in entrepreneurship are understood to make relatively higher contributions to family and social welfare, by more efficiently allocating returns from MSMEs and other employment opportunities to the most critical household assets, including health, education and food security, which themselves shape resilience in SALs. Preliminary findings from PRISE research also suggest that female entrepreneurs may be more likely to engage in sustainable adaptation than men (Crick et al., 2018a), while wider literatures emphasise that women’s responsibilities in households and communities position them well to find solutions to changing climate risks and to adapt livelihood strategies (UN WomenWatch, 2009; Wedeman and Petrunev, 2018).

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2 Even among formal enterprises, climate and business development finance opportunities are often limited. While microenterprises may be able to access finance through microfinance initiatives, and larger enterprises find it easier to access bank loans, these credit sources are often not suited to the more established, yet still vulnerable, enterprises that fall outside of micro-industry and within the larger ‘small’ and ‘medium’ enterprise classifications. This often creates a ‘missing middle’ when it comes to accessing finance for businesses (Fjose et al., 2010).

3 At macro-scales, the development economics literature over the last several decades, has similarly supported this narrative, associating gender equality and factors facilitating female inclusion within human capital accumulation and skill demanding economic activities with progress in macro development indicators, such as GDP growth (Baten and de Pleijt, 2018; Klasen and Lamanna, 2009).
There are also examples of table banking groups and other women’s groups and farmer cooperatives undertaking a range of other activities with potential to overcome barriers in business enabling environments and increase resilience in SALs. These include sharing knowledge, for example about new markets, technologies and production techniques and requirements (e.g. certification standards) and initiating cooperatives and other common pool resource management initiatives, such as reforestation and greenhouse farming. Producer groups and other forms of MSME aggregation are also mechanisms that have been used to reduce costs of trading (for example through group purchase of climate smart inputs, such as drought-resilient seeds) and to increase the lobbying power of small businesses in respect to both government programming and accessing new markets at better rates (Atela et al., 2018; Lemma et al., 2015; Tripathi et al., 2012). In any agenda that seeks to mobilise the private sector for equitable adaptation and climate resilient development, these diverse actors need to be accounted for.

Delivering transformative adaptation in SALs

For reasons outlined above, ‘development-as-usual’ pathways are likely to continue undermining resilience strategies among SAL populations, restricting development and limiting the ability of private actors to adapt to climate change. Continuing on current pathways risks prolonging the marginalisation of the poorest and most vulnerable groups, including informal enterprises, women, and pastoralists. While the exclusion of these private actors from public support services that enable business development and adaptation to climate change also undermines the potential to unlock opportunities to build broader resilience in SALs through the private sector.

We argue a radical shift in national policy landscapes is required that refocuses on leveraging the inherent adaptive capacities and flexibility of private actors in SALs and provides enabling business environments that support the full range of private sector actors in SALs to meet the challenges and opportunities of climate change.

Delivering on this agenda will be not be an easy task. Meaningful change will require a break from longstanding and entrenched national development trajectories. Moreover, policies and institutions deployed ostensibly to enhance SAL resilience have frequently had unanticipated consequences: Community-based adaptation and development strategies have often been deployed in ways that reinforce local power structures, with opportunities for capture of processes by local elites, government officials and private players (Bersaglio and Cleaver, 2018; Cleaver, 2012; Cleaver and Hamada, 2010; Galvin et al., 2018; Leach et al., 1999). Decentralisation often leads to recentralized control and has rarely been accompanied by transfer of sufficient funds to enable local government to fulfill their mandates (Hesse et al., 2013; Ribot, 2011; Scoones and Wolmer, 2003). Liberalisation agendas have often entrenched marginalization, by prioritising certain modes of doing business and failing to tackle barriers to market participation for the most vulnerable (Scoones and Wolmer, 2003). Similarly, climate responses that have been defined through short-term, projectised, single-sector responses have so often failed to recognise and respond to social context and build resilience over time (LDC Group, 2019).

Drawing on emerging strategies and novel mechanisms for supporting private adaptation that are showing signs of success within SALs, below we nevertheless propose key principals that we believe should be embedded within efforts to support development and adaptation within SALs.
Recommendation 1: Elevate the role of SALs and their inhabitants as key priority areas for 
appropriate investment and support within national and international development agendas

SALs have been neglected within development and adaptation landscapes for too long. National 
governments and their development partners need to recognise the importance of supporting 
adaptation in SALs for achieving climate-resilient development and the pledge within the 2030 Agenda 
for Sustainable Development to ‘leave no one behind’, and upscale support for adaptation in these 
areas. In order to meet the objectives under the Paris Agreement to make climate finance flows 
consistent with demand and needs, national representatives (‘focal points’) to the UNFCCC, should 
position SALs, and the private actors within them, as priority areas for investment and support. 
Developed countries and other development partners, meanwhile, should support SAL governments 
in this aim through institutional capacity-building and increasing the share of their funding 
commitments directed towards supporting adaptation within SALs.

Recommendation 2: Reorient SAL policy landscapes to focus on the public provision of enabling 
environments for private sector adaptation and climate resilient development

Maximising the opportunities of SALs requires a policy environment that capitalises on the existing 
adaptive capacities within SALs and puts private actors at the center of development and adaptation 
action. To do this, national governments, supported by development partners, will need to pursue a 
holistic approach to developing enabling environments for private adaptation and climate-resilient 
development. This will require supporting climate-specific adaptive capacity, for example through 
increasing access to climate-smart technologies and inputs, supporting the development of innovative 
climate tools and building capacity for climate information providers and private actors to translate 
climate information into useable formats that can inform adaptation options suited to SAL 
environments (Carter et al., 2019; Conway et al., 2019). But it will also require addressing the broader 
structural and development deficits that limit general business growth and development and shape 
underlying vulnerabilities, such as access to finance, transportation, water, energy, health, education 
and communication infrastructure.

These enabling conditions are not themselves specific to SALs, representing conditions required to 
support private adaptation and climate resilient business development more broadly. Yet they all 
deserve explicit consideration in public efforts to support private adaptation and climate-resilient 
development in SALs, where many of these elements are currently missing and where people are often 
acutely vulnerable. Since many of the factors required to enable adaptation in SALs are cross-cutting, 
spilling over the traditional remits and capabilities of any single sector, institution or actor, enabling 
conditions to support private adaptation will also require significant coordination across sectors and 
scales. To achieve this, policies and institutions targeting private sector development and climate 
change adaptation – which have to date been typically developed independently and remain 
 disconnected – need to be aligned.

Recommendation 3: Tailor support for businesses to grow and adapt to climate change to the 
diverse and specific needs of the private sector in SALs.

To avoid entrenching existing inequalities and to maximize opportunities for inclusive adaptation and 
growth, investments designed to deliver enabling environments for private adaptation in SALs need

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4 This is especially important in light of Tol and Yohe’s (2007) “weakest link” hypothesis, which suggests that 
adaptive capacity may be disproportionately influenced by the least developed aspects of enabling 
environments. This means that underinvestment in generic as well as climate-specific determinants of adaptive 
capacity could lead to fundamental gaps that could disproportionately limit people’s ability to adapt, despite 
additional public investment to support adaptation.
to be designed in ways that reflect the flexibility, heterogeneity, informality and mobility that are inherent to SAL socioeconomic systems and to the way in which private actors manage variability, buffer shocks and capitalise on opportunities. Specifically, this will require policies, products and services, that are flexible enough to support the diverse nature of actors and their activities and which support different adaptation responses, modes of production and ways of doing business within the same overall system.

The development of lightweight bee hives that women can carry from one geographical region to another in response to shifting climate pressures (Atela et al., 2018) is an example of the way in which even fairly simple inputs and technologies can be designed in ways that are more responsive to the needs of a wider range of economic actors in SALs. To avoid maladaptation and to support the sustainability of investments, the design and development of these products needs to be informed by climate information tailored to SAL environments and uncertainties (Conway et al., 2019; Vincent et al., 2018) and which support sustainable management of crucial natural resources: For example prioritizing green water management and avoiding blue water investments that threaten off-farm ecosystem services (Keys and Falkenmark, 2018).

Business finance opportunities especially need to be broadened to more inclusively target the range of private actors in SALs and their varied requirements, including Sharia-compliance in areas where Muslim populations live. These need to be made accessible to informal enterprise, individual producers, mobile pastoralists, women’s collectives and producer cooperatives, as well as to private actors that experience more restricted access to formal land ownership. International climate funds such as the Green Climate Fund, the Global Environment Facility and the Adaptation Fund, similarly need to be made more accessible to the private sector in SALs, by recognising the diversity in type, size and formality. For example, smallholder farmers should be recognised as ‘producers’ rather than simply ‘households’, to make them eligible for new streams of international climate finance for the private sector (Carabine and Simonet, 2018).

**Recommendation 4: Unlock broader resilience by building on productive sectors and driving innovation along value chains**

National governments and their development partners have a responsibility to ensure that all members of SAL societies have the ability to manage climate risk, engage in sustainable growth and adaptation and avoid transferring vulnerabilities along value chains. However, notwithstanding the need to mitigate the many challenges that underpin market-based development paradigms (see, for example, Scoones and Wolmer, 2003), opportunities to build adaptive capacity and unlock climate-resilient development through the private sector should be thoughtfully and critically scaled up in SALs.

Novel risk sharing mechanisms, mobilised through public private partnerships and multi-stakeholder partnerships\(^5\), have highlighted ways in which governments and their development partners can remove barriers to private sector investment in adaptation in SALs. For example, action and investments in areas such as infrastructure, research, data access, policy change and subsidies can help facilitate a business case for the private sector to develop new products, services or markets that build resilience and support local capacities in adaptation. These can and should include more vulnerable groups, in more marginalised regions, that would otherwise fall outside of market inclusion. In Senegal, for example, the national agricultural insurance fund, Compagnie Nationale d’Assurance Agricole du Sénégal (CNAAS), is a multi-stakeholder partnership that has brought

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\(^5\) Multi-stakeholder partnerships are typically partnerships that bring together actors from the three main social sectors: Government (national, regional and international), the private sector and civil society, including NGOs, research organisations, faith and grass-roots organisations (Dyer et al., 2013; Pauw and Chan, 2018a).
together the government of Senegal, insurance companies, farmer organisations and the private sector, including Senegal’s Agricultural Bank (La Banque Agricole6), to develop agricultural insurance products, including weather-index crop insurance products for smallholder farmers in remote areas. This has involved, among other things, investments in new rainfall stations, new crop production and climate databases and increased use of satellite data, to enhance data quality and improve the reliability of the weather indexes that expand the commercial viability of weather-index crop insurance products (MAERS Sénégal, 2018).

Value chain and market analyses are approaches that can help identify risks, weaknesses and opportunities within and along SAL value chains and identify and broker linkages between private actors that help maximise opportunities for the full range of private sector actors to contribute to resilience in SALs (Batool and Saeed, 2018; Bedelian et al., in press.; Carabine and Simonet, 2018). Creating a closer link between actors along the value chain, for example, can support the development of new products based on more climate-resilient crops: This is seen in Kenya where East African Breweries Limited (EABL) has developed a new low-cost beer which has provided smallholder cereal producers in Kenya’s eastern regions with access to a direct market for more climate resilient crops (Business Daily, 2018). Value chain analysis has also identified opportunities to increase the resilience of beef and milk value chains in the SALs of East and West Africa through the development of new market linkages with local processing and cold storage facilities (Carabine and Simonet, 2018).

Partnership, value chain and cooperative approaches, which depend on often uncertain market forces for their viability and which are embedded within formal and informal power structures that shape what decisions are taken and by whom (Eriksen et al., 2015), present their own challenges as models for structuring adaptation action. They require sensitive implementation and monitoring and evaluation – including of the distribution of risk and value added across the full range of economic actors – if they are to avoid further entrenching marginalisation and creating new vulnerabilities for SAL communities (Bulkeley and Newell, 2010; Schoonhoven-Speijer and Ruben, 2015; Selsky and Parker, 2005; Thorpe, 2018; Thorpe and Maestre, 2015; Tripathi et al., 2012). Nevertheless, building on productive SAL sectors and mobilising private sector investment in adaptation will likely be fundamental to plugging gaps in adaptation and development finance. Reflecting a need to broaden what Pauw and Pegels, (2013: 258) describe as “the private sector for adaptation”7, in SALs attention needs to turn to supporting the full range of private sector actors to contribute to equitable national development agendas, as drivers of inclusive sustainable development and climate resilience. Women and informal enterprise in particular need to be better supported and incorporated into the economy to fulfil their potential to become key agents of change. Within this agenda, innovation is required to identify and support business models that encourage private sector actors to develop equitable business linkages and partnerships with a wider range of other businesses, including those that don’t have the formal land entitlements that larger companies, seeking legislative protection and resource security, often require.

Recommendation 5: Reorient government policies to value and support human and livestock mobility

National and local governments need to support the mobility of people and livestock across borders by removing policies that seek to limit migration and population return and developing regulatory frameworks and legal instruments that support migrants’ rights and freedom of movement. For example, national and local governments need to think carefully about how to introduce social

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6 Formerly known as the Caisse Nationale du Crédit Agricole au Sénégal
7 International and national adaptation policy processes have typically focused on the role of large domestic and transnational companies in resourcing adaptation and driving innovation, with limited inclusion of MSMEs or recognition of their role (Averchenkova et al., 2016; Pauw and Chan, 2018b).
protection measures and labour laws that reduce the opportunity for exploitation of migrants and reduce their vulnerability (Newborne and Gansaonré, 2017; Wade et al., 2017). National governments also need to provide supportive infrastructure and financial services for effective migration, including for safe remittance transfers (Stapleton et al., 2017). These need to account for the heterogeneous nature of migrants, as well as the diverse forms of temporary and permanent migration that they may engage in and should be supported through the integration of migration planning across rural and urban scales, to avoid migrants falling between the cracks (Qaisrani et al., 2018; Qaisrani and Salik, 2018). Similarly, national and county governments need to develop an institutional framework that supports sharing of grazing resources and develop land use plans that transcend administrative boundaries and maintain and protect livestock corridors and migratory routes to facilitate the mobility of livestock across subnational or national borders. This will require creating and preserving corridors that enable livestock and wildlife movement between private lands and around infrastructure investments. And, in many regions, this will entail protecting communal landholdings from land subdivision (see also IPBES, 2018a, 2018b).

**Recommendation 6: Invest in inclusive bottom-up adaptation planning**

Fundamentally, the failure to account for the diverse and specific characteristics and needs of SAL populations – and to build on the strengths, dynamics and characteristics of dryland systems – has arisen from adaptation and development policy and practice too often ignoring local knowledges, practices and power structures and failing to give SAL businesses and households the power to shape development and adaptation provision according to their own specific needs and realities (c.f. Agrawal, 2011; Cleaver, 2012; Eriksen et al., 2015; Ferguson, 1990; Leach et al., 2010; Scott, 1999; Tanner and Alouche, 2011). It is therefore increasingly recognized that effectively supporting equitable and inclusive adaptation and climate-resilient development requires adaptation decisions to be made at the local level by local actors (e.g. Soanes et al., 2017).

The Devolved Climate Finance (DCF) mechanism that has been piloted in the drylands of Senegal, Mali, Kenya and Tanzania has grown from this school of thought, seeking to increase the adaptation funds that reach the local level and to support local actors and local institutions to make decisions about how and where to allocate these funds. The DCF mechanism is anchored within devolution and is designed to facilitate the flow of climate finance to local governments, while at the same time empowering local communities by strengthening their participation in the management and use of these funds (Crick et al., 2019; DCF Alliance, 2019; Odhengo et al., 2019; Orindi et al., 2017).

Ecosystem-based adaptation (EbA) approaches, that use biodiversity and ecosystem services to help people adapt to climate change, have similarly evolved around a commitment to co-produce adaptation solutions by combining local knowledges with evolving information about climate change (Reid et al., 2019b, 2019a). EbA currently receives a small proportion of adaptation finance compared to hard infrastructure options (Chong, 2014). Yet with increasing recognition of the parallel threat of biodiversity loss to the world’s poorest (Archer et al., 2018; Karki et al., 2018), nature-based solutions are gaining increasing political traction (Carrington, 2019; UN News, 2019; United Nations Secrety General, 2019). EbA can be integrated with devolved climate finance, multi-stakeholder partnership and value chain approaches to supporting adaptation (see for example Reid and Orindi, 2018). It offers a lens to ensure fundamental environmental and biodiversity safeguards are integrated into adaptation investments (Seddon et al., 2016a, 2016b). It has also shown some important potential to support cost-effective and equitable social resilience to climate change among SAL populations so dependent upon natural resources. Reid et al., (2019b), for example identifies a range of economic

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8 Soanes et al (2017) estimate that only US$1 in every US$10 committed from global climate funds between 2003 and 2016 was for local-level climate action.
benefits of EbA interventions for private sector actors, such as avoided costs (e.g. from reduced
dependence on agricultural inputs) decreased losses (e.g. fewer animal deaths from improved pasture
and reduced crop losses due to diversification on farms) and new market opportunities (e.g. from
tourism).

Building on such emergent approaches that support the principles of community-driven bottom up
planning and inclusion of climate-vulnerable people in decision making is likely critical. Indeed, this is
a key assumption underpinning rising interest in the multi-stakeholder partnership, value chain and
cooperative models for supporting adaptation, previously discussed. Yet if we are to achieve the 2030
Agenda for Sustainable Development pledge to ‘leave no one behind’, their development needs to
draw on the lessons of literatures which have highlighted the challenges of ensuring equitable
participation in local institutional arrangements and the potential for localised adaptation and
development planning responses to reproduce existing politics of exclusion, subordination and
vulnerability (e.g. Eriksen et al., 2015; Sovacool et al., 2015; Tanner and Allouche, 2011).

For governments, non-governmental organisations and other development partners supporting the
design and delivery of adaptation projects, market integration initiatives and new climate
partnerships, this is going to require a more critical engagement with the norms and forums of
decision making. What decisions get taken, by whom, and to what extent embedded arrangements of
authority reproduce social inequalities or create space to challenge them, require deep scrutiny
(Cleaver, 2012, 1999; Scoones, 2015, 2009). So too do the framings that justify specific sets of actions
to support adaptation and which are used to define what transformational adaptation looks like for
different actors (Adger et al., 2009; Eriksen et al., 2015; Tanner and Allouche, 2011). Development of
productive mechanisms for bridging global and local scientific and traditional knowledges and co-
producing locally tailored solutions, based on the aspirations and social and political realities of the
communities they seek to target, within the context of changing climatic parameters, are therefore
an urgent priority. This suggests the importance of broadening the research agenda focused on
identifying models of defining and co-designing inclusive adaptation institutions and modes of
participation with the diverse range of SAL actors they seek to target. Remodeling of monitoring and
evaluation frameworks to support this agenda will likely also be required.

Momentum for change

The need for a reorientation in SAL policy that mobilises local knowledges, experiences and practices
in action to support adaptation and development, as has been proposed in this paper, is not in itself
a novel assertion within academic development and adaptation literatures. Moreover, many of our
assertions are strongly reminiscent of the livelihood agenda that emerged with such force in the 1990s
(see for example, Scoones and Wolmer, 2003). However, progress towards these goals to date has
remained inadequate. This paper, reflecting on practical experience with supporting climate change
adaptation in SALs, has grown from a belief that the time to move beyond routine and incremental
policy changes in current development pathways (cf. Few et al., 2017; Kates et al., 2012) and to drive
innovation within the adaptation and development of SALs through refocusing on the role of private
actors, is now.

Earlier iterations in development policy reform, can reassure us of the potential to reshape prevailing
methods, frameworks, funding commitments and resource flows in line with evolutions in

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9 Scoones (2015: 82), drawing on earlier work of Henry Bernstein, poses some key questions that communities,
development practitioners and researchers should be asking, which provide a helpful entry point into the
reflexivity required. These are: Who owns what (or who has access to what)? Who does what? Who gets what?
What do they do with it? How do social classes and groups in society and within the state interact with each
other? How do changes in politics get shaped by dynamic ecologies and vice versa?.
development theory (Scoones, 2009). Meanwhile, globally, political will for transformative adaptation action is higher than it has ever been before. Alongside commitments under the United Nations 2030 Agenda for Sustainable Development and the Paris Agreement, are a range of other initiatives at international levels, designed to support innovation in adaptation planning and upscale adaptation action, consistent with local demand and needs and through participatory mechanisms. These include the ‘empowering locally led action’ track from the Global Commission on Adaptation (https://gca.org/global-commission-on-adaptation/action-tracks), as well as the LDC Initiative for Effective Adaptation and Resilience (LIFE-AR), being led by the Least Developed Countries (LDC) Group (http://www.ldc-climate.org/about-us/long-term-initiatives/), which itself recognises the need to go beyond business as usual and to develop transformative strategies in adaptation planning.

Momentum created at international and national levels by these agendas should provide a positive force for tackling historical and current drivers of marginalisation, for giving voice to this critical agenda and for challenging intransigent political barriers to inclusive development in SALs. Delay will be more costly than action now (Stern, 2007). With developing countries under pressure to prepare their Nationally Determined Contributions (NDCs) ahead of the 2020 update deadline, national governments have an important window of time to rethink the ways in which they have approached development and adaptation in SALs to date, to clearly articulate their priorities, and to request the necessary international support.

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Author contributions

K.E.G. and F.C. led the analysis and manuscript writing. All authors contributed to the ideas and discussed and reviewed the manuscript.

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