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Private adaptation in semi-arid lands: a tailored approach to 'leave no one behind'

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Non-technical abstract

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 capitalize on the knowledge, institutions, resources and practices of SAL populations in adaptation action.

Technical abstract

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 refocuses 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 realizing 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 marginalized areas that have limited access to markets, infrastructure and services (Middleton *et al.*, 2011; Thorpe & 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.

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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 (cf. Manuel-Navarrete & Pelling, 2015; Pelling *et al.*, 2015). 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 Semi-arid 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 characterized 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 maximize their own welfare (de Jode, 2009; Hesse, 2011; Hesse *et al.*, 2013; Mortimore & Adams, 1999; Mortimore *et al.*, 2009). This flexibility in autonomous adaptation behaviour (cf. 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 long-standing traditional strategies, characterized by mobility, flexibility and reciprocity, to manage the variability of resources in drylands and gain access to pasture and water (Bedelian & 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 & Kerven, 2013; Behnke & Muthami, 2011; de Jode, 2009; Hesse *et al.*, 2013; Hesse & 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 & Raza, 2009; Newborne & Gansaonré, 2017; Stapleton *et al.*, 2017; Waldinger & 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 & 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 & 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 & MacGregor, 2006; Mortimore, 1989, 1998; Mortimore & Adams, 1999; Mortimore *et al.*, 2009; Rain, 1999; Scoones, 1995). However, driven by typically centralized and top-down approaches to adaptation and development policy, national governments in developing countries have almost invariably failed to capitalize 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 destabilized 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 disorganized 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 & MacGregor, 2006; Jenet *et al.*, 2016; Leach & Mearns, 1996; Swift, 2003). In addition, policy development in Africa's SALs has had a long history of favouring agriculture over pastoralism and encouraging sedentarization and the privatization and commercialization 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 & Salik, 2018). Other examples of large scale, centrally managed development strategies that have eroded or failed to recognize 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 & Taylor, 2001; Weng *et al.*, 2013; see also Hesse, 2011; Scoones & Wolmer, 2003).

An under-recognized 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 emphasized the aridity and climatic variability that characterizes 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 (Jobbins *et al.*, 2018; 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.[i] 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 & 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 & 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 Behnke & Muthami, 2011; Carabine *et al.*, 2017; de Jode, 2009; Hesse & MacGregor, 2009; ICPALD, 2013; Rodriguez, 2008). 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 recognized. 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 & Simonet, 2018; Gannon *et al.*, 2018b).

Within this landscape, SALs have suffered from long-term and disproportionate under-investment and political and economic marginalization 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 & Byerlee, 2011; Dzumbira *et al.*, 2017).

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 (cf. Cleaver, 1999, 2012). 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 & Saeed, 2018; Carabine & 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.

Signalling 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 (Crick *et al.*, 2018a; see also Agrawala *et al.*, 2011; Averchenkova *et al.*, 2016; Chaudhury, 2018; Conway *et al.*, 2019; Crawford & 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 & Saeed, 2018; Carabine & Simonet, 2018; Stein *et al.*, 2013).[ii] 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 & 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 & 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.[iii] 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 emphasize 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 & Petruney, 2018).

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 mobilize the private sector for equitable adaptation and climate resilient development, these diverse actors need to be accounted for.

Delivering transformative adaptation in SALs

For the 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 marginalization 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 not be an easy task. Meaningful change will require a break from long-standing 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 & Cleaver, 2018; Cleaver, 2012; Cleaver & Hamada, 2010; Galvin *et al.*, 2018; Leach *et al.*, 1999). Decentralization often leads to recentralized control and has rarely been accompanied by transfer of sufficient funds to enable local government to fulfil their mandates (Hesse *et al.*, 2013; Ribot, 2011; Scoones & Wolmer, 2003). Liberalization agendas have often entrenched marginalization, by prioritizing certain modes of doing business and failing to tackle barriers to market participation for the most vulnerable (Scoones & Wolmer, 2003). Similarly, climate responses that have been defined through short-term, 'projectized', single-sector responses have often failed to recognize 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 principles 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 recognize 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.

Maximizing the opportunities of SALs requires a policy environment that capitalizes on the existing adaptive capacities within SALs and puts private actors at the centre 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.[iv] 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 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 capitalize 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 geographic 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 & 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 recognizing the diversity in type, size and formality. For example, smallholder farmers should be recognized as 'producers' rather than simply 'households', to make them eligible for new streams of international climate finance for the private sector (Carabine & 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 & 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, mobilized through public private partnerships and multi-stakeholder partnerships,[v] 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 (Gannon *et al.*, 2020). These can and should include more vulnerable groups, in more marginalized regions, that would otherwise fall outside of market inclusion (Gannon *et al.*, 2020). 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 together the government of Senegal, insurance companies, farmer organizations and the private sector, including Senegal's Agricultural Bank (La Banque Agricole[vi]), 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 (MAER 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 maximize opportunities for the full range of private sector actors to contribute to resilience in SALs (Batool & Saeed, 2018; Bedelian *et al.*, 2019; Carabine & 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, providing 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 & 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 marginalization and creating new vulnerabilities for SAL communities (Bulkeley & Newell, 2010; Schoonhoven-Speijer & Ruben, 2015; Selsky & Parker, 2005; Thorpe, 2018; Thorpe & Maestre, 2015; Tripathi *et al.*, 2012). Nevertheless, building on productive SAL sectors and mobilizing private sector investment in adaptation will likely be fundamental to plugging gaps in adaptation and development finance. Reflecting a need to broaden what Pauw & Pegels (2013: 258) describe as 'the private sector *for* adaptation',[vii] 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 protection measures and labour laws that reduce the opportunity for exploitation of migrants and reduce their vulnerability (Newborne & 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 & Salik, 2018; Qaisrani *et al.*, 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 Archer *et al.*, 2018; Karki *et al.*, 2018).

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 (cf. Agrawal, 2011; Cleaver, 2012; Eriksen *et al.*, 2015; Ferguson, 1990; Leach *et al.*, 2010; Scott, 1999; Tanner & Allouche, 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[viii] 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 knowledge with evolving information about climate change (Reid *et al.*, 2019b, 2019a). EbA currently receives a small proportion of adaptation finance compared with 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 Secretary General, 2019). EbA can be integrated with devolved climate finance, multi-stakeholder partnership and value chain approaches to supporting adaptation (see, for example, Reid & 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 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 probably 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 localized 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 & Allouche, 2011).

For governments, non-governmental organizations 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, 1999, 2012; Scoones, 2009, 2015).[ix] 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 & Allouche, 2011). Development of productive mechanisms for bridging global and local scientific and traditional knowledge 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. Remodelling 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 mobilizes local knowledge, 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 & 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 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 recognizes 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 marginalization, 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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Notes

i 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, 10 million people in Pakistan rely on the textile industry for employment (Batool & Saeed, 2018).

ii 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).

iii 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 & de Pleijt, 2018; Klasen & Lamanna, 2009).

iv This is especially important in light of Tol & 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.

v 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 organizations, faith and grass-roots organizations (Dyer *et al.*, 2013; Pauw & Chan, 2018).

vi Formerly known as the Caisse Nationale du Crédit Agricole au Sénégal.

vii 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; Schaer & Kuruppu, 2018).

viii 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.

ix 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?

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