

POLICY BRIEF



CLIMATE-RESILIENT ECONOMIC DEVELOPMENT IN KENYA'S ASALS: A PATHWAY TO ACHIEVING THE BIG FOUR AGENDA

CLAIRE BEDELIAN | ELIZABETH CARABINE | MOHAMMED Y. SAID
ROBINA ABUYA | JOANES ATELA | FRED ATIENO | FLORENCE CRICK
KATE GANNON | STEPHEN MOIKO | JOSEPH MUHWANGA
SIMON WAGURA NDIRITU AND CATHERINE SIMONET

Key messages

1. Kenya's arid and semi-arid lands (ASALs) are sites of major economic activity and are vital to national food security. The ASALs will therefore play a big role in Kenya's Big Four Agenda¹. As areas of growth and opportunity, the Kenya government should fully integrate the ASALs into the national economy if it is to achieve the Big Four Agenda, especially related to 100% food security and nutrition, and manufacturing.
2. Climate change represents a big threat to the achievement of the Big Four Agenda. Five of Kenya's ASAL counties (West Pokot, Laikipia, Turkana, Baringo and Narok) have already passed the 1.5°C average warming threshold, which is enshrined in the Paris Agreement, with 12 more counties projected to follow by 2050. By 2070, maximum temperatures in all counties are expected to exceed 1.5°C, and in the counties of Wajir, West Pokot and Tana River, temperature increases will exceed 2°C. Projections indicate that the impacts of climate change will be significant in the ASALs, as detailed in the IPCC Special Report on Global Warming of 1.5°C published in October 2018.
3. To manage the impacts and take advantage of opportunities associated with climate change, the Kenya government and its development partners need to support the productive sectors in the ASALs, such as the livestock sector, and prioritise investments and policies that will enhance climate-resilient economic development. These include investments to upgrade and transform the livestock value chain for better quality meat, milk and leather products. Doing so will contribute to the achievement of the Big Four Agenda.
4. There is a clear role for government to provide an enabling environment, such as through climate information, extension and financial services, for private sector adaptation and to support businesses, in particular small and medium enterprises (SMEs), in their efforts to adapt to the impacts of climate change.

ASALs as the new frontier for economic development

The ASALs cover 89% of Kenya, support 38% of the population (RoK 2012), and are Kenya's major meat producing areas, contributing more than 80% of domestic red meat consumption (Behnke and Muthami, 2011). The livestock sector alone contributes 12% of national GDP and 43% of agricultural GDP (approximately US\$ 4 billion per year) as well as employing 50% of the agricultural workforce (Behnke and Muthami, 2011).

Due to their size and economic potential, the ASALs will play an important role in the realisation of the Big Four Agenda, which are

achieving 100% food and nutrition security, increasing manufacturing to 15% GDP, providing affordable housing and universal healthcare. With the right investments, the ASALs productive sectors can contribute significantly to achieving food and nutritional security, through increased and more commercialised production of meat and milk. The ASALs can also increase the share of manufacturing and agro-processing nationally by upgrading the meat and dairy value chains and diversifying into related industries, including

¹This is Kenya's development targets in four key areas: affordable and decent housing; affordable healthcare; food and nutrition security; and employment creation through manufacturing.

leather. This is also in line with Kenya's long-term development agenda, Vision 2030, which identifies the ASALs as a top priority for investment.

The ASALs are sites of significant demographic shifts as people migrate into these counties to pursue economic opportunities. The 2009 population census shows that between 1999 and 2009, the population growth rate in the ASALs was 4% compared to a national growth rate

of 2.6%. Fourteen (14) out of the 21 ASAL counties registered population growth rates higher than the national average; Mandera (14.1%), Wajir (7.3%), Turkana (6.4%), Kajiado (5.3%), Marsabit (5.1%), West Pokot (5.1%), Narok (4.6%), Garissa (4.6%), Samburu (4.4%), Isiolo (3.5%), Lamu (3.3%), Baringo (3.2%), Kilifi (3.0%), Tana River (2.8%) and Kwale (2.7%) (Figure 1). These huge population increases add to the significant investment required in the ASALs.

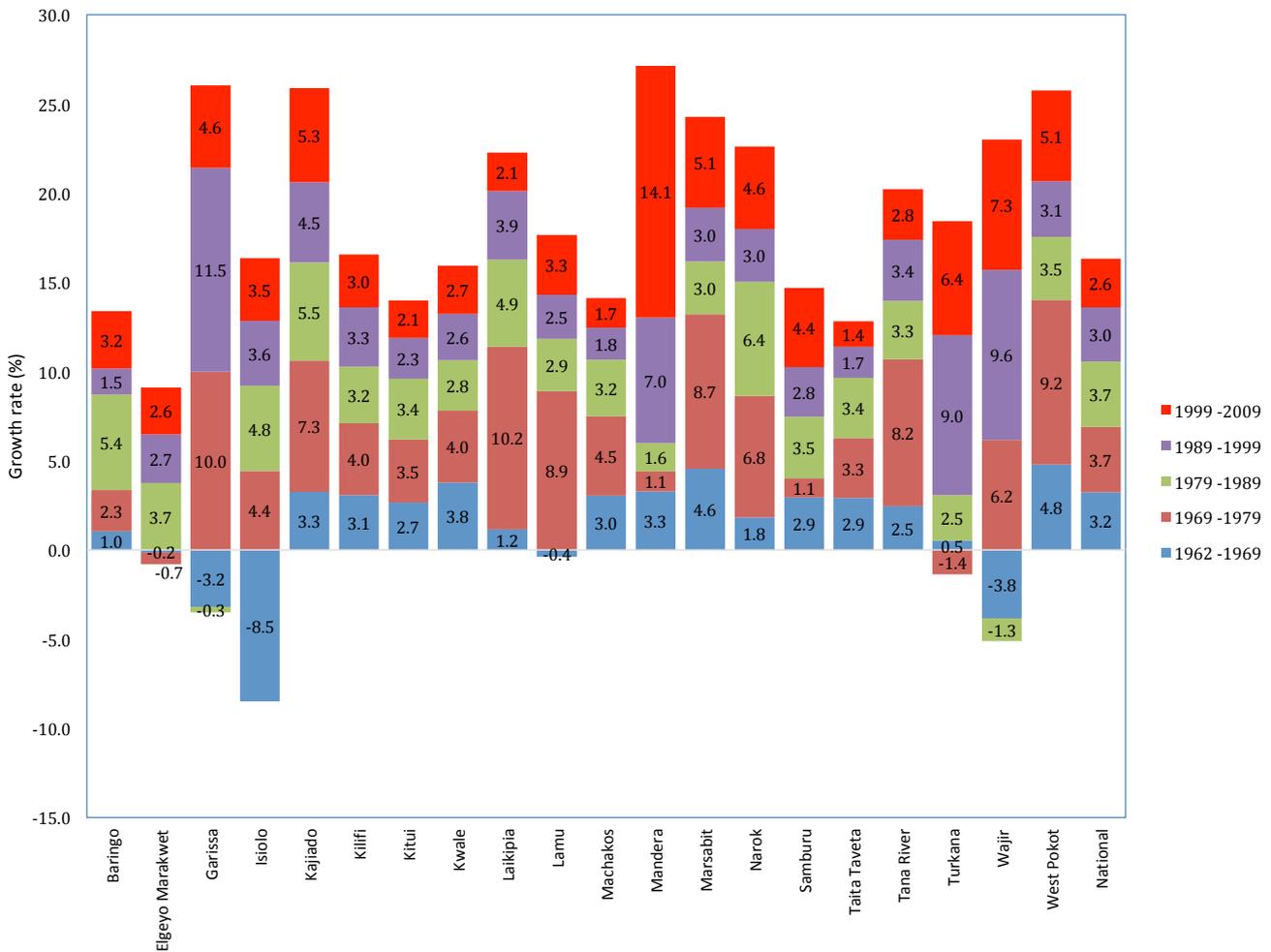


Figure 1: Population dynamics in Kenya's ASAL counties and nationally between 1962 and 2009.



Risks in the ASALs

The risks that climate change poses to the achievement of the Big Four Agenda are well recognised in Kenya's National Climate Change Action Plan 2018–2022. Climate impacts are predicted to be particularly pronounced in the ASALs where the economy and rural livelihoods are highly dependent on climate-sensitive activities. Impacts are already being felt, with increasingly frequent and severe droughts and floods, more erratic rainfall and higher average temperatures affecting food production and water availability (IPCC, 2014). The latest evidence for the 21 ASAL counties shows an increase in temperature between 1977 and 2016, with five counties (West Pokot, Laikipia, Turkana, Baringo and Narok) surpassing the 1.5°C UNFCCC warming target enshrined in the Paris Agreement (Said et al., in review). Rainfall has declined in 15 out of the 21 counties between 1960 and 2014 (Ogutu et al., 2016). Future trends based on the Representative Concentration Pathway (RCP) 4.5 climate projection², show that increases in temperature will continue with another 12 counties exceeding 1.5°C warming by 2050, as well as an increase in rainfall during the short rainy season (October–November–December) (Figures 2 and 3; Said et al., in review).

These climate changes are likely to have huge impacts on livestock and crop production in the ASALs. Projections show that by the 2030s, 7 out of the 21 ASAL counties will have more than 50% of their cattle range above 30°C, the temperature at which cattle production will be physiologically affected by reduced feed intake and reproduction (Said et al., in review). Associated water stress, limited forage availability and the spread of pests and diseases will directly affect the quantity and quality of livestock production (IPCC, 2018). As well as increasing the risks of food insecurity and malnutrition in the ASALs,

the economic costs due to reduced cattle productivity and the potential cattle losses are likely to be significant. It is estimated that 1.7 million cattle will be affected, equal to a potential loss of between 34 and 68 billion Kenyan shillings (cattle prices range between KSh 20,000 and KSh 40,000 per head) (Said et al., in review). The IPCC Special Report on Global Warming at 1.5°C states that globally, a decline in livestock of 7–10% is expected at about 2°C of warming, with associated economic losses of between \$9.7 and \$12.6 billion (Boone et al., 2018).

Climate change will exacerbate other drivers of change such as land fragmentation, migration and population growth, and increase environmental pressure such as on water demand and soil quality. The privatisation and fragmentation of the rangelands is resulting in the creation of small land parcels, inhibiting mobility, and the ability to access seasonal or drought pastures, thus exacerbating vulnerability to climate change (Moiko et al., 2019). Land tenure change may provide investment options to build climate resilience for those that are able to secure land, but it also marginalises women and other vulnerable groups, and can reduce their ability to absorb climate shocks (Atela et al., in review).

Combined with an expected exponential increase in human population from 38.6 million in 2009 to an estimated 95 million by 2050, climate change poses a serious threat to Kenya's food security and achievement of the Big Four Agenda. Using a population growth rate of 3.4% – the average increase in the population of the ASALs between 1962 and 2009 – (KNBS, 2010), it is projected that by 2030, 13.4 million livestock keepers will have their livestock range affected by maximum temperatures above 30°C (Said et al., in review).

²RCP 4.5 is a moderate climate change scenario used in the IPCC fifth assessment report (AR5) in 2014.

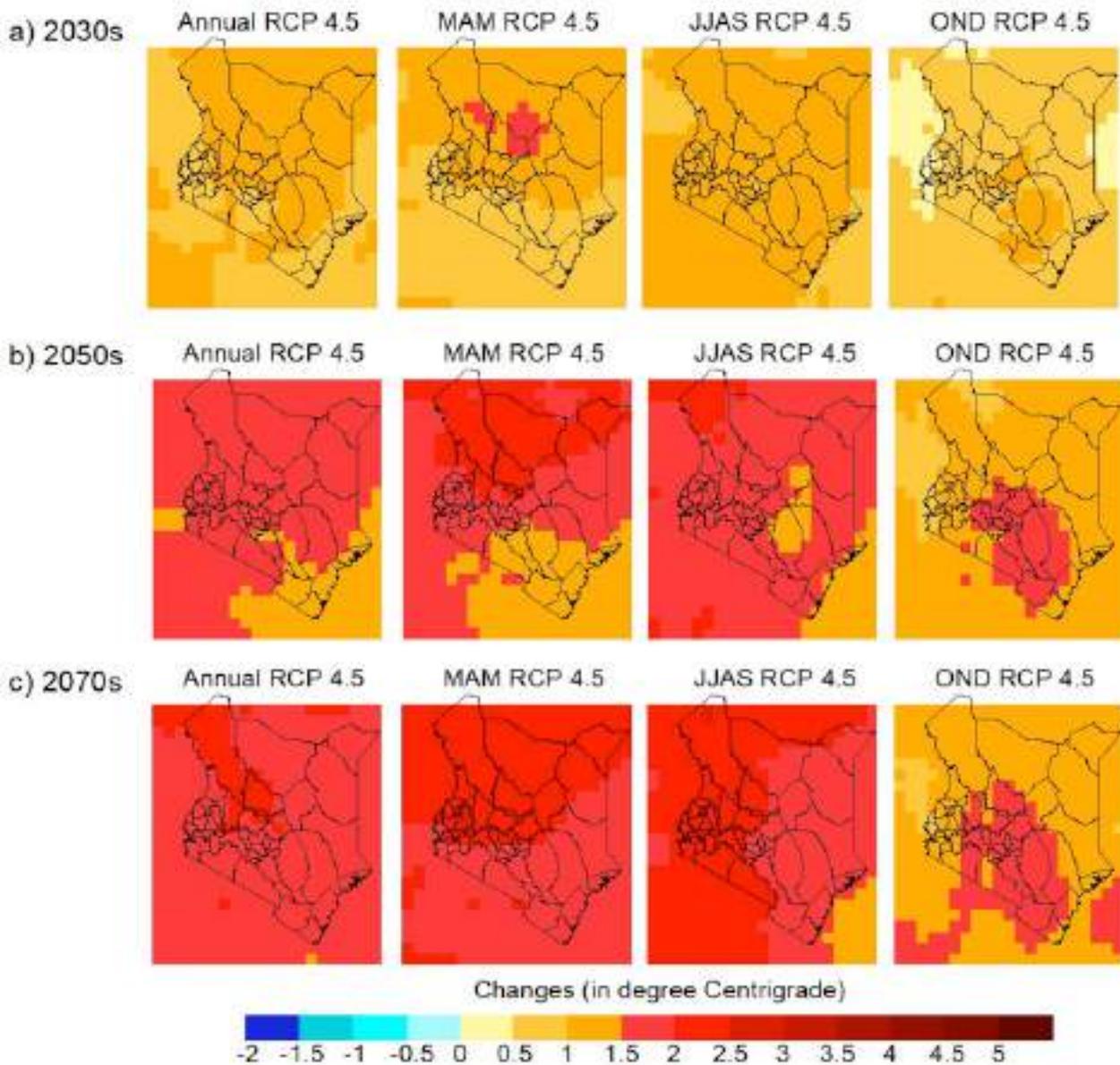


Figure 2. Projected changes in the annual, March–April–May (MAM), June–July–August–September (JJAS), and October–November–December (OND) maximum temperature over Kenya for RCP 4.5. Each row corresponds to RCP 4.5 emission scenario for 2030s, 2050s and 2070s.

“

These climate changes are likely to have huge impacts on livestock and crop production in the ASALs.



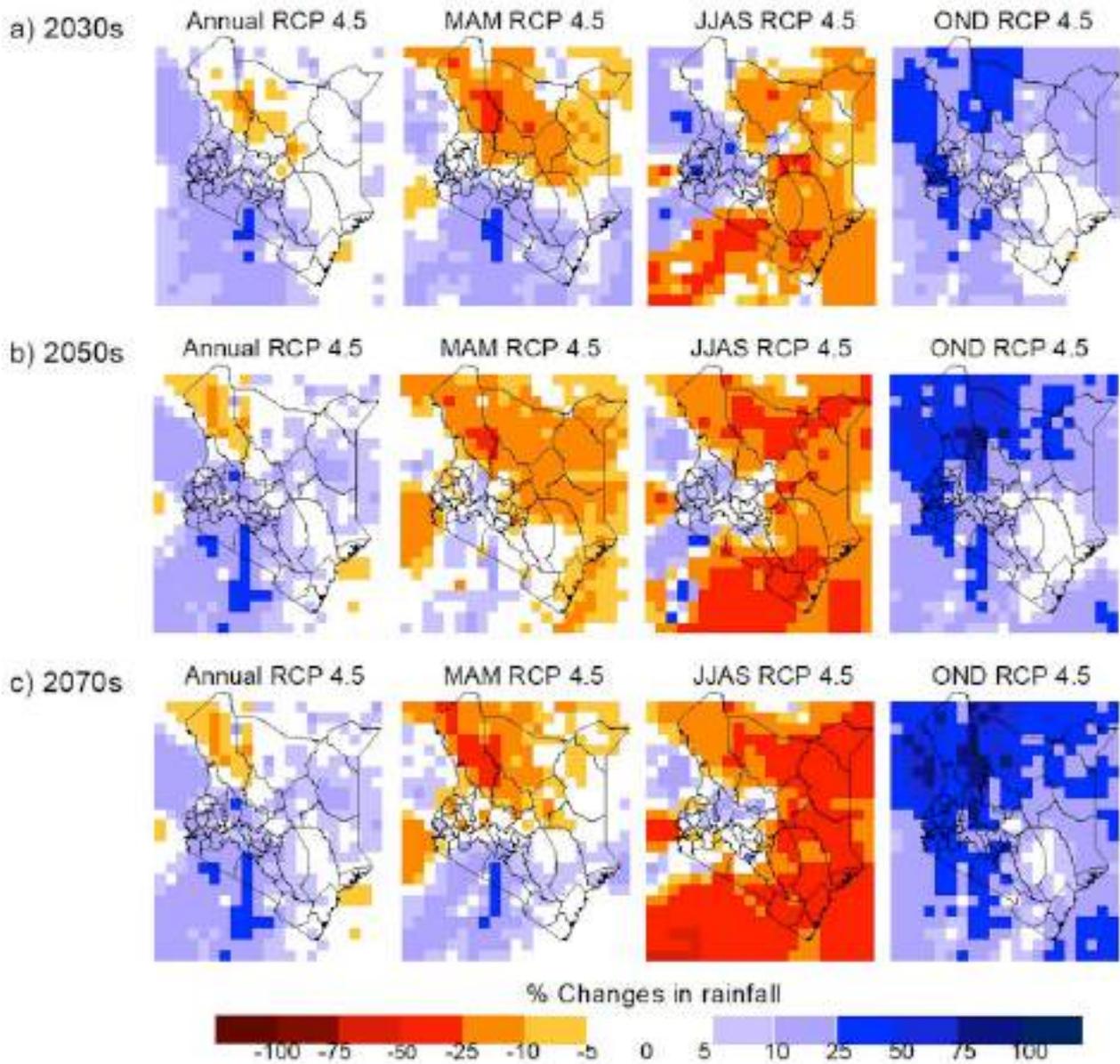
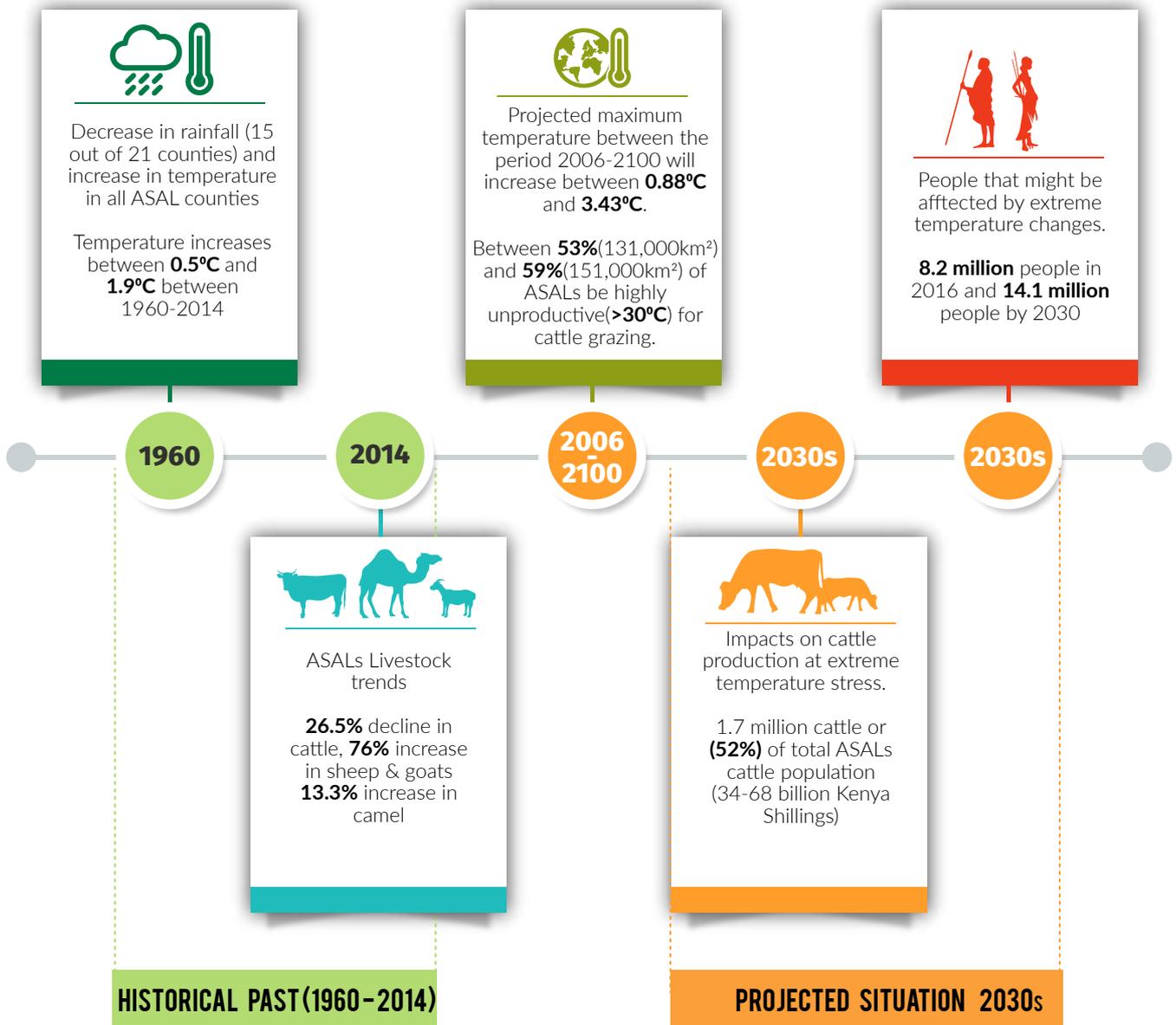


Figure 3. Projected changes in the annual, March–April–May (MAM), June–July–August–September (JJAS), and October–November–December (OND) rainfall over Kenya for RCP 4.5. Each row corresponds to RCP 4.5 emission scenario for 2030s, 2050s and 2070s.





Infographic: Historic changes in climate, livestock population and projected impacts (Said et al., in review)



Harnessing the opportunities in a changing climate

Sectors where production is rooted in the ASALs are vulnerable and exposed to climate risk but there is also inherent adaptive capacity in these systems that can form the basis of climate-resilient economic development (Carabine and Simonet, 2018). The demand for livestock products – meat and milk – is growing as urban centres expand and wealth levels increase. A shortfall in Kenya's domestic beef supply of 18% (KMT, 2014) is currently being met by cattle coming in from neighbouring countries, including Tanzania, Ethiopia, Somalia and South Sudan. This points to opportunities for growth and transformation in the livestock sector that can contribute to the food security and manufacturing aims of the Big Four.

There are options for investing in a climate-resilient livestock sector that can create employment and revenue, and realise growth in the future while increasing food security and the share of manufacturing in the sector. This includes through: the production of hay or other sources of feed for fattening cattle that can fulfil demand in expanding high-end markets; breeding programmes to promote climate-resilient and commercially attractive traits; investments in cold storage in the meat chain that allow the development of a 'cold chain', beyond the high-end markets; increased value addition to beef, especially low quality meat (for the low-end markets); and vertically-integrated private or community livestock enterprises that link livestock directly to markets (for the high-end markets) (Bedelian et al., 2019; Ndiritu and Said, in review).

Access to finance, pricing information and early warning systems are limited in the ASALs. Although some actors in the chain may have access to informal credit arrangements, the limits on credit availability and a lack of capital were identified as barriers to implementing adaptation options (Bedelian et al., 2019; Ndiritu and Said, in

review). More supporting services that are better designed for pastoral production systems, can help producers and traders to engage and invest in business opportunities.

But not all adaptation strategies by private actors are sustainable or sufficient to deal with current or future climate risks and there is a clear role for governments to provide the right enabling conditions to support private adaptation (Bedelian et al., in review; Carabine and Simonet, 2018; Crick et al., 2018ab; Gannon et al., 2018; Ndiritu and Said, in review). This includes through policy intervention that supports better access to finance and markets, and enhanced availability of climate information and early warning systems.

Temporary or permanent migration is an important resilience strategy against the impacts of climate change in the ASALs, through diversification into other economic livelihoods and the transfer of remittances. Livestock mobility, enabled through social networks that are driven by customary institutions, are important sources of resilience to drought and other climate shocks in the ASALs (Bedelian et al., in review; Carabine and Simonet, 2019). High rates of migration into the ASALs can be attributed to emerging opportunities. Land tenure changes in the ASALs, from communal to privatised land, also open up new market and value addition opportunities for enhanced investment and the expansion of agriculture, trade and infrastructure in the ASALs (Moiko et al., 2019). Rural to urban migration brings significant remittances that contributes to poverty reduction and investment in the ASALs.

Small and Medium Enterprises (SMEs) play an important role in Kenya's economy as they employ around 80% of the workforce and contribute 20% to the GDP (Intellicap, 2015). Yet, they are highly vulnerable to climate change and will need support from the government to adapt to the impacts

of climate change for them to remain a key driver of the country's growth and employment (Crick et al., 2018b). In the ASALs, women play a major role in running SMEs that support household livelihoods and build resilience (Atela et al., 2018). Female-led SMEs are more likely to engage in sustainable adaptation strategies in response to climate risk (Crick et al., 2018a). Social networks, such as women's

groups and table banking initiatives, are an important adaptation tool for women, creating opportunities for sharing knowledge, identifying new opportunities to diversify enterprise and pool resources to facilitate the introduction of new climate-resilience technologies and to build market linkages (Atela et al., 2018).

Recommendations for investments in the ASALs for climate-resilient economic development and the Big Four Agenda

As sites of considerable projected climatic and demographic change, the Kenya government and development partners will need to support climate change adaptation and investments in the ASALs to achieve climate-resilient economic development. This will ensure that the Big Four Agenda's goals of ensuring 100% food and nutritional security, and increasing manufacturing of leather products and agro-processing in meat and dairy value chains, are achieved. By supporting the development of the productive sectors, such as livestock, and the private actors involved in these sectors, such as SMEs, the Kenya government can unlock the potential of the ASALs at the same time as contributing to the Big Four Agenda.

This research makes the following recommendations:

- The national and county governments need **to change the narrative of ASALs that capture their potential as the new frontiers of development in Kenya**. This will help raise the profile of the ASALs and recognise them as areas that will be increasingly important for climate-resilient economic development and investment. As part of this, government and development partners should place greater emphasis on the importance of ASALs and particularly the livestock sector in achieving the targets of the Big Four Agenda and Vision 2030.
- The national and county governments, supported by development partners, will need **to support adaptation within the range of private actors already thriving in Kenya's ASALs**. SMEs are recognised as key to value addition and manufacturing in the Big Four Agenda. The ability of private actors to respond to climate risks will depend on factors that are shaped through implementation of supporting policies. These interventions need to target and be accessible to the full range of private sector actors in ASALs, including informal actors, producer associations and women-led enterprises.
- The national and county governments, supported by development partners and the private sector, need to ensure that adequate investments and an appropriate enabling environment for public and private adaptation are developed in order to achieve national and county development goals and increase resilience to climate shocks. What is clear is that **public and private sectors must partner together to deliver services and infrastructure** for livestock sector development, including:
 - ◇ **Increased investments in fodder and feedlot development**, as promoted in the Big Four Agenda, to provide opportunities for improving the fattening and finishing of the livestock value chain.

- ◇ **Development of livestock marketing infrastructure** such as abattoirs, livestock weighing machines, and holding grounds adjacent to markets, to improve the efficiency of market operations and encourage better returns to livestock owners.
- ◇ **Upgrading and investing in the hides and skins value chains**, in order to produce sufficient good quality leather products. This requires that sufficient quality and quantity of livestock are raised to provide the necessary by-products of the hides and skins. There is currently minimal processing of hides and skins in Kenya. The leather industry is a priority sector under manufacturing in the Big Four Agenda. Upgrading the hides and skins value chain can contribute to economic growth through expanding exports of leather products (RoK, 2015).
- ◇ **Development of financial services and credit systems** that are better designed and tailored to pastoral production systems and informal SMEs in the ASALs.
- ◇ **Development and dissemination of timely and appropriate climate services**, including early warnings systems and climate information by the Meteorological Department and the National Drought Management Authority (NDMA), for early action and decision-making in relation to food and nutritional security.
- The national and county government should develop and implement policies to facilitate the mobility of people and livestock. These policies and associated implementation strategies need to incorporate and take account of the inherent adaptive capacity of the ASALs – including flexibility, mobility and informality – that will be important in managing increasing climate risk. This includes supporting sustainable land and pasture management through resource sharing mechanisms, such as livestock corridors and strengthened social networks.
- The national and county governments, supported by their development partners, should adopt and implement inclusive policies that support and enhance the adaptive capacity of women, youth and other vulnerable groups. Although the national government recognises the need to support female-led enterprises in various policies, including climate change legislation, these policies are currently poorly implemented and mainstreamed at the local level. More support and priority is needed for the benefits of these policies to be realised in real terms.
- The national government should investigate what the impacts of climate change will be for the Big Four Agenda. This should include a full assessment of the potential impacts of climate change on livestock and crops in achieving food and nutritional security, as well as an understanding of the economic cost of not taking adaptation or mitigation action against the impacts of climate change.
- The National Climate Change Action Plan 2018–2022 is well aligned with the Big Four Agenda. The Big Four Agenda should now be aligned with Kenya's Climate-Smart Agriculture Implementation Framework 2018–2027, which aims to promote the growth of climate-resilient low carbon and sustainable agriculture that ensures food security and contributes to national development goals. To ensure implementation of the Big Four Agenda at the county level, county governments should strive to align their County Integrated Development Plans (CIDPs) and other development plans and strategies, with the Big Four priorities.

ASALs and the Big Four Agenda

Despite the risks faced, ASALs present areas of significant economic growth potential for Kenya and should be integrated more fully into national and county development plans. A greater focus on the ASALs in the Big Four Agenda will help to achieve the goals of 100% food and nutritional security, and increasing manufacturing through SMEs, as well as ensuring that no region or population group gets left behind.

The Big Four Agenda could do more to harness opportunities presented by the ASALs and the livestock sector in Kenya, recognising the importance of livestock products such as meat and milk, which are vital for adequate food and nutritional security. Greater inclusion of livestock and ASAL priorities in the Big Four Agenda would better support uptake at the (ASAL) county level. While policy formulation is left to the national government, implementation, such as the investments that will be required in

livestock infrastructure and marketing, falls under the mandate of county governments.

There is a clear role for the Kenyan government to support public and private investment in the livestock value chain, as well as in SMEs in the ASALs, to enhance resilience to climate change. A more supportive enabling environment, such as through access to finance, markets, early warning systems and other extension services, are important for adaptation to climate change. In order to target and prioritise these investments, a more detailed assessment of climate risks facing the ASALs should be carried out. With a greater understanding of the risks that will affect the delivery of development plans and the Big Four Agenda, investments and policies can be designed to build on the inherent adaptive capacity of producers, households and businesses in the ASALs.

THE BIG 4 AGENDA



References

- Atela, J., Gannon, K. E. and Crick, F. (2018). Climate change adaptation among female-led micro, small and medium enterprises in semi-arid areas: A case study from Kenya., in: Leal Filho, W. (Ed.), Handbook of Climate Change Resilience. Springer, Cham, pp. 1–18.
- Bedelian, C., Moiko, S. and Said, M.Y (2019). Harnessing opportunities for climate-resilient economic development in the semi-arid lands: The Kenya Southern Rangelands Beef Value Chain. PRISE Working Paper. Nairobi: Kenya Markets Trust. London: Overseas Development Institute.
- Bedelian, C., Moiko, S. and Atela, J. (in review). Land tenure influences pastoralist grazing management and climate change adaptation strategies: Gender and equity implications.
- Behnke, R. and Muthami, D. (2011). The contribution of livestock to the Kenyan economy. IGAD Livestock Policy Initiative Working Paper 03–11, 1–62.
- Boone, R. B., Conant, R. T., Sircely, J., Thornton, P. K. and Herrero, M. (2018). Climate change impacts on selected global rangeland ecosystem services. *Global Change Biology*, 24(3), 1382–1393. Doi:10.1111/gcb.13995.
- Carabine, E. and Simonet, C. (2018). Value Chain Analysis for Resilience in Drylands: identification of adaptation options in key sectors. Pathways to Resilience in Semi-Arid Economies (PRISE) Working Paper. Available at: <http://prise.odi.org/research/value-chain-analysis-for-resilience-in-drylands-vc-arid-identification-of-adaptation-options-in-key-sectors-2/>.
- Crick, F., Eskander S., Fankhauser S. and Diop M. (2018a). How do African SMEs respond to climate risks? Evidence from Kenya and Senegal. *World Development* 108: 157–168.
- Crick, F., Gannon K. E., Diop M. and Sow M. (2018b). Enabling private sector adaptation to climate change in sub-Saharan Africa. *WIREs Climate Change* 9 (2).
- Gannon, K. E., Crick F., Rouhaud E., Conway D. and Fankhauser S. (2018). Supporting private adaptation to climate change in semi-arid lands in developing countries. PRISE Policy Brief.
- Intellectcap. (2015). Closing the Gap Kenya: Update on Key Challenges for the “Missing Middle” in Kenya. Available at: <http://intellectcap.com/wp-content/themes/intellectcap/pdf/26.10.15.pdf>
- IPCC. (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. Geneva, Switzerland: IPCC.

IPCC. (2018). Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp.

KMT. (2014). Kenya livestock and meat market analysis for cattle, goat and sheep. Kenya Markets Trust/I-DEV International.

Kenya National Bureau of Statistics (KNBS). (2010). The 2009 Kenya Population and Housing Census: Population Distribution by Age, Sex and Administrative Units, KNBS, Nairobi.

Moiko. S., Bedelian. C., Said. M.Y., Abuya R. and Atela., J. (2019). Land use transformation in Kajiado county, Kenya: Implications of a changing climate. PRISE Policy Brief. Nairobi: Kenya Markets Trust.

Ndiritu, S. W. and Said, M. Y. (in review). Harnessing opportunities for climate-resilient economic development in semi-arid lands: adaptation options in the beef value chain in Laikipia County, Kenya. PRISE Working Paper. Nairobi: Kenya Markets Trust.

Njoka, J. T., Yanda, P., Maganga, F., Liwenga, E., Kateka, A., Henku, A., Mabhuye, E., Malik, N., Bavo, C. and Schubert, C. (2016). Kenya: Country situation assessment. PRISE working paper.

Ogutu, J. O., Piepho, Hans-P., Said, M. Y., Ojwang, G. O., Njino, L. W., Kifugo, S. C. and Wargute, P. W. (2016) Extreme wildlife declines and concurrent increase in livestock numbers in Kenya: What are the causes? PLoS ONE 11 (9).

Republic of Kenya (2012). Vision 2030: Development Strategy for Northern Kenya and Other Arid Lands. Office of the Prime Minister. Ministry of State for Development of Northern Kenya and other Arid Lands.

Republic of Kenya (2015). Kenya Leather Industry: Diagnosis, Strategy and Action Plan. Ministry of Industrialization and Enterprise Development

Said, M. Y., Ogutu, J. O., Bedelian, C., Moiko, S., Muhwanga, J., Abuya, R. and Carabine, L. (in review). Projected climate change impacts on cattle in Kenya's arid and semi-arid lands based on RCP 2.6, 4.5 and 8.5.

Acknowledgements

This policy brief is based on five years of research carried out in Kenya by the Pathways to Resilience in Semi-Arid Economies (PRISE) research consortium. The PRISE consortium comprises the Overseas Development Institute (ODI), UK; the Grantham Research Institute for Climate Change and the Environment, UK; Innovation Environnement Développement (IED) Afrique, Senegal; the Sustainable Development Policy Institute, Pakistan; Kenya Markets Trust (KMT), Kenya; the Regional Environmental Centre for Central Asia (CAREC), Tajikistan; the University of Ouagadougou, Burkina Faso; and the University of Central Asia, Kyrgyzstan. PRISE is a consortium under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA), with financial support from the UK Government's Department for International Development (DfID) and the International Development Research Centre (IDRC), Canada.

We acknowledge the following individuals who shared additional insights or provided support during the design and writing process: Robin Mbae at the Kenya Ministry of Agriculture, Livestock and Fisheries for valuable comments on the brief; Helen Mountfort, Nathalie Nathe and Rajeshree Sisodia at ODI for support during the writing process; Kamau Kuria and Charles Warria at KMT for providing the necessary facilitation and support during the research period; and Mirriam Mulei, Abdikarim Daud and John Wamahiu in the KMT livestock team for providing technical information and support.

Citation:

*Bedelian, C., Carabine, E., Said, M. Y., Abuya, R., Atela, J., Atieno, F., Crick, F., Gannon, K., Moiko, S., Muhwanga, J., S. Wagura Ndiritu and Catherine Simonet (2019): Climate-resilient economic development in Kenya's ASALS: A pathway to achieving the Big Four Agenda. **PRISE Synthesis brief. Nairobi: Kenya Markets Trust.***





Better Markets, Better Lives

CONTACT US



14 Riverside, Cavendish Block,
2nd Floor, Suite B, Riverside Drive.



+254 20 2588343
+254 722 201233



info@kenyamarkets.org
www.kenyamarkets.org