



Kenya: Country situation assessment

Working paper



THE CENTER FOR
SUSTAINABLE DRYLAND
ECOSYSTEMS & SOCIETIES



PRISE

Pathways to resilience
in semi-arid economies

Research for climate-resilient futures

Kenya: Country situation assessment

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Front cover image:

Woman farmer carrying firewood

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Acronyms

ASAL	Arid and Semi-arid Lands
ASCU	Agricultural Sector Coordination Unit
ASDSP	Agriculture Sector Development Support Programme
ASF	ASAL Stakeholders' Forum
CARIAA	Collaborative Adaptation Research Initiative in Africa and Asia
CBO	Community-Based Organisation
CRS	Congressional Research Service
CSA	Country Situation Assessment
DFID	Department For International Development
DRR	Disaster Risk Reduction
EAC	East African Community
EDE	Ending Drought Emergencies
EHRP	Emergency Humanitarian Relief Plan
FEWS NET	Famine Early Warning System Network
GDP	Gross Domestic Product
HFA	Hyogo Framework for Action
ICT	Information and Communication Technology
IDDRSI	IGAD Drought Disaster Resilience and Sustainability Initiative
IDRC	International Development Research Centre
IGAD	Inter-Governmental Authority on Development
IPCC	Intergovernmental Panel on Climate Change
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KMS	Kenya Meteorological Services
LAPSSET	Lamu Port-South Sudan-Ethiopia Transport
NARC	National Rainbow Coalition
NDCF	National Drought Contingency Fund
NDMA	National Drought Management Authority
NEMA	National Environmental Monitoring Authority
NGO	Non-Governmental Organisation
PRISE	Pathways to Resilience in Semi-arid Economies
UK	United Kingdom
UN	United Nations
UNDP	UN Development Programme
UNFCCC	UN Framework Convention on Climate Change
UNISDR	UN Inter-Agency Secretariat of the International Strategy for Disaster Reduction
US	United States
USAID	US Agency for International Development
USGS	US Geological Survey
WCRP	World Climate Research Programme
WRI	World Resources Institute

Executive summary

The overall objective of the Pathways to Resilience in Semi-arid Economies (PRISE) project is to identify research opportunities for the generation of new knowledge that will inform and influence policy and development actors responsible for mainstreaming a climate change-resilient economic development approach in Kenya's arid and semi-arid lands (ASALs). This desk review specifically seeks to contribute towards the identification of research gaps that will inform policy formulation and the development agenda that will mitigate negative climate change impacts for improved livelihoods/welfare of ASAL communities. It also identifies opportunities for leveraging existing initiatives and networks of development actors working towards building a climate-resilient development approach in ASALs.

Kenya has 23 ASAL counties, which constitute about 88% of the country's land mass. Of the 23 counties, 9 of them are classified as arid and 14 as semi-arid. The extent of aridity within each of the ASAL counties and across counties is variable, not homogenous. The arid counties are predominantly pastoral (high mobility of pastoralists and livestock), with limited crop farming. The semi-arid counties are mostly agro-pastoral, with integrated crop/livestock production systems common. In terms of socioeconomic development, the ASALs are generally marked by low human development (e.g. high levels of poverty, low literacy) and low population density but a high growth rate and poor infrastructure. However, they are also endowed with a variety of natural resources, key among them being wildlife biodiversity, forests, wetlands, various minerals and diverse cultural characteristics.

Development challenges related to the changing dynamics in ASALs are of various forms. For instance, although mobility is the key coping strategy for pastoralists, the trend towards sedentarisation is increasing as a result of insecurity, with some pastoralists settling down to farm for greater household food security. The increasing population coupled with in-migration from non-ASALs continues to exert pressure on natural resources such as land, as well as on social services. This is reflected by the mushrooming of settlements and urban centres in a haphazard manner, leading to dire consequences such as loss of wildlife and livestock migratory corridors. Degradation of ecosystems is also evident, causing a loss of grazing land and key resource areas. Land fragmentation resulting from the subdivision of communal land and subsequent privatisation is now common in ASALs, leading to changes that are inconsistent with rational and sustainable land use.

Changes in rainfall and temperature patterns have been observed in the past 50 years (USGS and USAID, 2010). Although rainfall is highly variable across different regions in Kenya, wet extremes have been observed every 10 years, and this is expected to increase in the future (Herrero et al., 2010). A key observation is that rainfall has become irregular and unpredictable, with more intense downpours (Nzau, 2003). The trend will be different for the ASALs and the highlands. On average, increases in both minimum and maximum temperatures have been observed across Kenya. In the ASALs, actual observed temperature trends indicate significant 'warming' (USGS and USAID, 2010). Meanwhile, analysis of climate trends in Kenya shows productive crop areas are shrinking (ibid.). This, coupled with the crop failure common during drought periods, is an indication of serious challenges and the need for measures within the agriculture sector that will protect livelihoods and ensure local and national food security.

Experiences from the past clearly show that extreme climate events have had dire socioeconomic consequences in Kenya. Declines in gross domestic product (GDP) and drops in national economic growth follow each drought, because of the rise in the cost of basic food items owing to major crop failure and livestock losses and the need for food imports and emergency responses. The agriculture sector contributes about 26% of national GDP. Kenya's economy is therefore sensitive to climate variations, as most agricultural and livestock production is dependent on rainfall. Recent estimates of the economic impact of drought and related shocks are in the range of 0.7-1.0% of GDP (World Bank, 2011). The overall effects of the 2008-2011 drought in Kenya were estimated at Ksh 968.6 billion (\$12.1 billion) (Republic of Kenya, 2012b).

Low levels of human development and high levels of poverty, which increase vulnerability in the Kenya's ASALs, mean climate shocks and stresses, especially drought, normally have greater consequences in these areas, such as acute food shortages. Other socioeconomic consequences of climate change include changing demographic patterns in ASALs: people settle in towns as a result of losses of livestock-based livelihoods and of insecurity and conflicts arising from competition for scarce resources.

Climate change has also been blamed for negative ecological impacts in ASALs. The ASALs are rich in flora and fauna but are experiencing a rapid loss of biodiversity. The total population of large grazing wildlife species in Kenya's ASALs reportedly declined by 61% between 1977/78 and 1994/96 (WRI, 2007). While this cannot be fully blamed on changes in climate, it has been noted that climate change impacts are compounded by factors such as local environmental degradation owing to practices like deforestation and encroachment into fragile ecosystems. Unsustainable practices such as overharvesting trees for charcoal, overgrazing and overstocking are contributing to significant land degradation in ASALs, and we anticipate climate change will further compound the already fragile situation. An ecosystem management approach needs to be integrated in climate change adaptation measures in order to enhance the resilience of local communities through an improved and sustainable flow of ecosystem services.

Despite a huge amount of effort and financial commitment by the government and development partners over many years to deal with climate risks and disasters (through relief and humanitarian interventions), the trend points to an increase in the number of relief-dependent people, poverty levels and vulnerability to climate shocks and stresses. The approach has thus proved ineffective in terms of dealing with climate change impacts, leading to a rethink so as to generate a new strategy. This has seen the rise in importance of disaster risk reduction (DRR) strategies and linking humanitarian/relief efforts to long-term development as a strategy for enhancing long-term climate-resilient livelihoods. Kenya's strategy to end drought emergencies has adopted this integrative approach; it is therefore expected that the PRISE project will contribute to the realisation of this strategy.

Socio-ecological systems in Kenya's ASALs and in the Horn of Africa are undergoing transformations mediated by extreme climate events like drought and floods and by sociocultural changes. This is a challenge for the promotion of climate-resilient pathways and there is therefore justification for in-depth analysis of the autonomous adaptation strategies of affected communities to assess their potential to enhance or undermine pathways to resilience in ASALs. The increasing trend towards sedentarisation and subsequent urbanisation in ASALs owes to a large extent to frequent droughts and internal conflicts (Fitzgibbon, 2012). New tools and development approaches are needed to address vulnerabilities related to unsustainable land use/management practices, which are weakening traditional and local

institutions and increasing natural resource-based conflicts.

Opportunities for climate-resilient development for poverty alleviation lie in the restoration of degraded ecosystem services and especially in reversing declining land productivity. Investment in human capital development to enable the uptake of new technologies is urgently needed to prevent social instability and conflict arising as a result of a lack of alternative (non-livestock-based) livelihoods. ASALs are rich in biodiversity, which should contribute towards an improvement of livelihoods within a framework of a total economic valuation of resources and payment of ecosystem services. The integration of ASAL economies with the rest of the national economy will also strengthen resilience to climate change. Markets and trade in ASALs therefore need to be supported to reduce losses of livestock and livestock products as a result of climatic factors. Sustainable harvesting of wild dryland products like charcoal, gums and resins represents a new opportunity for entrepreneurs.

Stakeholder engagement in Kenya yielded key recommendations for PRISE. It was observed that county governments have significant resources to invest in climate adaptation strategies and community mobilisation. Several policies are also in place; it will be critical to assess their implementation and effectiveness in building climate resilience. Security, infrastructure and human capital are key pillars for development and resilience. Research needs to focus on the challenges of upscaling good adaptation practices; the impacts of urbanisation and sedentarisation on pathways to resilience in ASALs; the effects of climate change on local governance; and the need for a total economic valuation of resources in ASALs, among other issues.

Proposed PRISE project sites in Kenya are the arid counties of Isiolo and Marsabit and the semi-arid counties of Makueni and Kajiado. Different land uses, livelihood options, land tenure, infrastructure, traditional knowledge and population trends in these counties will provide valuable comparisons and lessons for various climate change adaptation options.



1. Introduction

Arid and semi-arid lands (ASALs) cover 40% of global land biomass, 70% of the Inter-Governmental Authority on Development (IGAD) sub-region and over 89% of the Kenyan land mass (Republic of Kenya, 2012a). ASALs in Kenya are highly prioritised for investment and economic development, as the Vision 2030 Development Strategy for Northern Kenya and Other Arid Lands shows (Republic of Kenya, 2011a). These areas are highly vulnerable to climate change and climate variability, leading to increasing levels of poverty, land degradation and human conflict, among other impacts. The Pathways to Resilience in Semi-arid Economies (PRISE) project is one of several development partner initiatives to generate new knowledge and ideas for climate-smart development investments for sustainable and resilient livelihoods in ASALs.

PRISE adopts a 'policy and development-first' approach to engaging decision-makers in governments, businesses and trade bodies. Rather than starting with complex climate change projections, it begins by identifying the decisions people need to make now about investment choices and development options for semi-arid regions. This demand-led approach means PRISE has the flexibility to support policy-makers and investors with targeted, quick-response research and the capacity to lead longer-term collaborative studies.

The Country Situation Assessment (CSA) for Kenya is part of the PRISE inception phase. It provides a macro-level analysis of issues related to resilience-building in Kenya's ASALs. The report contributes to the identification of potential research priorities and sites for the implementation of PRISE, and identifies key opportunities likely

to have influence over policies. Specifically, it focuses on the following:

- Analysis of the past and current climate (temperature and rainfall trends), with a keen focus on the semi-arid areas of Kenya;
- Identification of potential opportunities and challenges for the attainment of climate-resilient and inclusive development of semi-arid lands that both eliminates poverty and enhances people's capacity to adapt to climate change;
- Recommendations of options to address the complex challenges of natural resource management, economic development, poverty alleviation and climate variability/change.

1.1 Research questions

The CSA seeks to answer the following critical questions:

- How do current and future climate risks compound other environmental, social and economic stress factors in semi-arid regions, and how can these risks be managed?
- How does climate-resilient development as a strategy for poverty alleviation differ, in concrete terms, from the traditional recommendations of development policy, and how should adaptation be integrated into economic development policies?
- What are the new opportunities for and threats to markets in semi-arid lands arising from climate change in such areas, and how is the private sector adapting?
- How do natural resource management policies condition vulnerability and resilience in critical pathways between

natural resources, economic growth and poverty alleviation?

- How are climate impacts accelerating demographic changes and human endowments, and what are the implications for vulnerable groups in terms of access to the benefits of markets and development?

1.2 Methodological approach

The CSA involved a review of existing policy and institutions relevant to ASAL development in Kenya. It looked at various policies and strategies, to find out how they respond to issues of adaptation to climate change and resilience-building in ASALS. It also evaluated the relevance of some key government- and donor-supported programmes in ASALS and how well they have addressed issues of climate disaster risk reduction (DRR) and link with long-term development as a means of building livelihood resilience in Kenya's ASALS in the face of climate change and climate change-related shocks and stresses.

Additionally, the review focused on topical issues related to ASAL natural resource management, ASAL livelihoods and livelihood assets and impacts of climate change and variability, as well as cross-cutting issues. Sources of information and data included policy documents, project reports, online databases and maps, journal papers and views expressed in stakeholder forums dealing with dryland issues.

1.3 Relevance of the CSA

The CSA and scoping study on Kenya's ASALs will contribute to understanding of the country's climate-resilient development strategy as stated in various policies.

It will therefore contribute to a better understanding of 'the underlying causes of vulnerability in drought-prone areas, in particular [with an] emphasis on pastoralists and agro-pastoralists to promote disaster risk reduction, ecosystem rehabilitation and sustainable livelihood practices'

in line with the IGAD Summit Declaration of 2011. Kenya, as a member of IGAD, is committed to promoting informed policies and actions leading to the end of frequent drought emergencies. This report is therefore aligned with the Kenyan government strategy for the

development of ASALs. Sessional Paper 8 on the development of ASALs is the main framework addressing climate-resilient development, the PRISE objectives and the terms of reference for this study.



2. Understanding arid and semi-arid lands of Kenya

ASALs in Kenya cover an extensive land area and are endowed with various capital assets that support livelihoods and ecosystem functioning. The following subsection presents a synopsis of geographical coverage, key biophysical characteristics, livelihood assets and socioeconomic trends in Kenya's ASALs.

2.1 Geographical distribution of ASAL counties

Kenya has 23 ASAL counties, 9 of them classified as arid and 14 as semi-arid, as Figure 1 shows. The light brown areas represent the

semi-arid areas and the dark brown areas the arid areas.

Table 1 provides information on the different climatic conditions, based on the former ASAL districts, which numbered 36 before they were amalgamated into counties.

Figure 1: Distribution of ASAL counties in Kenya



Note: Arid counties (dark brown area): Baringo, Garissa, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana and Wajir. Semi-arid counties (light brown area): Embu, Kilifi, Kwale, Laikipia, Lamu, Makueni, Meru, Narok, Nyeri, Taita Taveta, Tharaka Nithi, Kitui, Kajiado and West Pokot.

Source: <http://www.dmikenya.or.ke/where-we-work.html>

Table 1: Categorisation of districts based on percentage of ASAL coverage

Category	Districts	% of total ASAL
100% ASAL	Turkana, Moyale, Marsabit, Isiolo, Wajir, Mandera, Garissa, Ijara	62
85-100% ASAL	Kitui, Makueni, Tana River, Taita Taveta, Kajiado, Samburu	25
50-85% ASAL	Machakos, Mwingi, Mbeere, Tharaka, Laikipia, West Pokot, Kwale, Kilifi, Baringo, Meru North	8
30-50% ASAL	Lamu, Narok, Transmara, Malindi, Keiyo, Marakwet	3
10-25% ASAL	Nyeri (Kieni), Rachuonyo, Suba, Kuria, Thika, Koibatek	2

Source: Adapted from Republic of Kenya (1992).

Table 2: Moisture availability zones in the Kenyan rangelands

Zone	Classification	Moisture index (%)	Annual rainfall (mm)	% of Kenya's land area
IV	Semi-humid to semi-arid	40-50	600–1,100	5
V	Semi-arid	25-50	450-900	15
VI	Arid	15-25	300-550	22
VIII	Very arid	<15	150-350	46

Source: Sombroek et al. (1982).

2.2 Biophysical characterisation of ASALs

Kenya is divided into seven agro-climatic zones. Zones I-III are considered to have high potential for cropping, given favourable moisture availability, whereas Zones IV-VII comprise semi-humid to arid regions, covering 88% of Kenya's land mass, as Table 2 shows.

ASALs' key defining feature is their aridity. They represent ecosystems characterised by low, erratic, variable precipitation (with high temporal and spatial variability) and high inter-annual climatic variability. Temperatures in arid areas are high throughout the year, resulting in high rates of evapotranspiration, more than twice the annual rainfall.¹

Dominated by grasslands, shrublands and scattered woody vegetation, ASALs support more than 70% of the national livestock population and 90% of the wildlife that is the mainstay of the tourism sector (Republic of Kenya, 2004). ASALs also contain much of Kenya's potential and exploited commercial mineral wealth (ibid.)

Rainfall in the ASALs of Kenya is highly variable in terms of space and time and is associated with high-intensity storms (Mati et al., 2006). High runoff is usually evidenced, resulting from an absence of

vegetation cover and high-intensity rains. The soils are shallow, of light to medium texture, low-fertility and susceptible to erosion, compaction and capping. Water availability and accessibility represent a key constraint to production. Pastoralists and agro-pastoralists dominate the arid and semi-arid counties, with livestock production the main livelihood (Republic of Kenya, 2012a).

2.3 ASAL livelihood assets

Livelihood assets are the available capital resources people use to make a living. These have been classified into five categories (DFID, 1999): natural, physical, social, financial and human capital, as this sub-section demonstrates. The ASAL climate influences the abundance and distribution of these resources and how they are used to support resilient livelihood pathways.

Natural capital

Natural capital comprises of the resource assets ecosystem services (supporting production; regulatory; aesthetic) that are used to support human wellbeing in ASALs. These intangible public goods (such as biodiversity) and tangible assets (vegetation; water; land; animals) are critical to livelihoods in terms of food security and human health.

ASALs are endowed with various resources. Water sources include few permanent rivers and seasonal streams, which flow only during the wet season and remain dry for the

rest of the year. Water is the main limiting factor in ASALS. Ownership of water sources is usually vested in the local community rather than in the household.

Vegetation varies widely in terms of both space and season. In the lowlands, it is for the most part dominated by grass and scrubland. In the slightly wetter semi-arid areas, the natural vegetation type is woody savannah, whereas forests fed from the mist in the clouds cover the higher grounds like Mounts Marsabit, Kulal and Huri.

Land is also an essential productive asset in ASALS. Pastoralist areas in Kenya are for the most part in the northern and north-eastern areas of the country and fall under the Trust Lands Act (2012).² This implies country councils hold the land in trust for the community. These grazing lands are often encroached by settlers, who sometimes erect fences. Furthermore, irrigation has converted some otherwise dry areas to more productive cropland, which has inhibited the mobility of the pastoralists and grazing on this land. In some areas, common land is increasingly being converted into private property, further encouraging crop farming, which uses the best grazing land.

Physical capital

Physical capital comprises the basic Infrastructure and producer goods needed to support livelihoods, and

¹ http://akvopedia.org/wiki/Impact_of_drought_on_WASH_systems

² <http://faolex.fao.org/docs/pdf/ken62437.pdf>

includes roads, markets, abattoirs, schools, health centres, food storage, information and communication technology (ICT) and transport facilities. These are limited and poorly developed in ASALs. Government services such as policing, markets and local governance are also limited. ASAL counties also lag behind in terms of access to safe drinking water, electricity and telecommunication facilities. This disadvantages the inhabitants of ASALs in terms of development and capacity-building.

This socioeconomic status is likely to change with the implementation of major infrastructure projects such as the Lamu Port–South Sudan–Ethiopia Transport (LAPSSET) Corridor, which is expected to open up northern Kenya and spur economic growth (see Figure 2). LAPSSET is the most significant

infrastructure project since independence and will help address the inequalities in the road transport network in ASALs, which is thin, disjointed and in places non-existent (Republic of Kenya, 2011a).

Further research is required with respect to whether existing and proposed massive infrastructure development like LAPSSET supports service delivery for the benefit of ASALs communities.

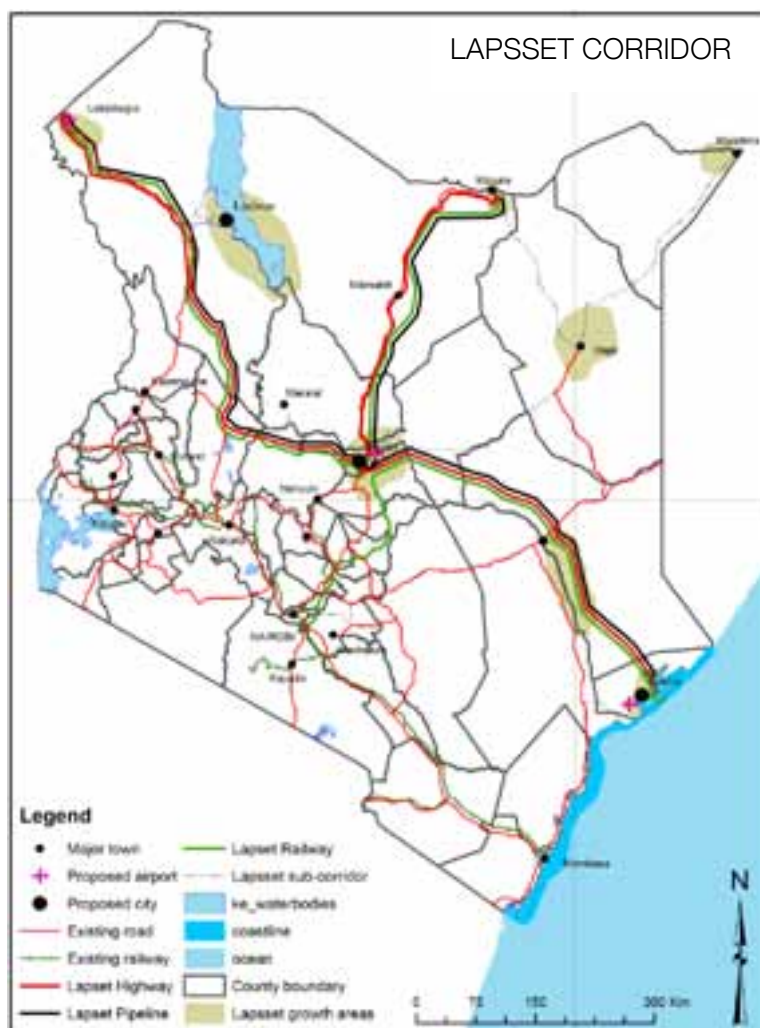
Social capital

Social capital is defined as ‘social resources upon which people draw in pursuit of their livelihood objectives’ (DFID, 1999). These social resources are formed through networks and connectedness, through membership of various groups such as environmental committees, grazing committees and cooperatives, livestock market

associations and water management committees, among others. They are critical to community conflict management and provide the last resort safety net support for households in times of need.

Most of the ASAL population still has strong social networks and traditional institutions, which provide an enabling political and economic investment environment that supports sustainable development for enhanced wealth and employment creation. Majorities are organised into extended families and clans, which provide important support during times of hardship. Pastoralists are characterised by high mobility, moving with their herds in search of graze lands and water, hence taking advantage of the scattered rainfall more than any other production system.

Figure 2: LAPSSET Corridor in Kenya



Source: LAPSSET.

Over-dependence on the dwindling natural resource base, owing to increasing human population and degradation of ecosystems, is likely to escalate the poverty levels of the pastoralists and agro-pastoralists.

Financial capital

As alluded to earlier, ASALs contribute significantly to Kenya's livestock and wildlife population, which contributes greatly to wildlife-based ecotourism in the country. Mutual interaction between wildlife and pastoralism, coupled with the rich cultural practices of pastoral and agro-pastoral groups in ASALs,

remains a major attraction for tourists and contributes greatly to the national economy. Nomadic pastoralism, ranching, agro-pastoralism and agriculture are the other economic activities occurring in ASALs. However, the majority of both pastoralists and sedentary farmers are poor and have limited cash; the few rich own either larger herds or more fertile land.

Pastoralists tend to have more capital in the form of animals than do sedentary farmers, which they sell for subsistence. Formal employment in urban centres is also a source of income for some people.

The poor marketing system, weak communication and insecurity, among other factors, have been a disadvantage. With few banks and limited credit facilities, pastoralists rely on informal financial sources like friends and relatives by loaning out livestock. Nevertheless, the emergence and rapid growth of mobile money in Kenya has significantly improved access to remittances and are transforming banking. The situation is expected to improve as ICT and banking facilities continue to expand into ASALs.



Pastoralist child learning how to read and write

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Human capital

DFID (1999) defines human capital as 'the skills, knowledge, ability to labour and good health that together enable the people to pursue different livelihood strategies and achieve their livelihood objectives'. Analysis

of human capital contributes to our understanding of a core dimension of poverty in ASALs.

The main pastoral (pastoralist and agro-pastoralist) populations include the Maasai, Samburu, Turkana, Somali Rendille, Borana, Gabra,

Dasanech, Pokot and Galla. The ASALs are home to nearly one-third of the population and 70% of livestock in Kenya (Fitzgibbon, 2012).

Low human capacity in ASALs is reflected in high illiteracy levels, which fall below the national average.

For instance, in some arid counties, female literacy is less than 10%, against a national average of 69% (Republic of Kenya, 2013a); in Samburu county literacy is at 20% and in Narok county it is at 63% (Republic of Kenya, 2014b; 2014d, respectively). This is mainly because of, among other things, low enrolment rates in primary schools and low completion rates at high school level. Many children drop out of school as a result of poverty, cultural factors, insecurity, lack of education facilities and high mobility of pastoral groups, among other things.

In addition, high illiteracy rates, especially among women, contribute to low-skilled labour. Education is considered a critical enabler in adopting technologies and there is therefore a need to invest in both academic/formal and functional education for ASAL communities.

Pastoralists and agro-pastoralists have immense wealth of indigenous knowledge regarding their environment and animals, drought prediction, pastures and water locations, and how to prevent and treat livestock diseases. Indigenous sedentary farmers have equivalent knowledge about their crops and soils.

2.4 Socioeconomic trends in the ASALs of Kenya

Socioeconomic trends in ASALs areas partly reflect the negative impacts of extreme climatic events and droughts. In the Kenyan ASAL context, we observed socioeconomic trends associated with population growth and influx into ASALs, rapid sedentarisation of pastoral communities, changes in traditional land use and land tenure regimes, high levels of poverty, natural resource-based conflicts and changes in gender roles, among others. The following sub-sections highlight some of these trends.

Population dynamics and settlement patterns

Kenya's human population figures have more than tripled over the past four decades, rising from 10.9 million in 1969 to 38.6 million in 2009 (Republic of Kenya, 2013a). Kenya's ASALs host 35% of the country's human population, which translates to 14 million people (Republic of Kenya, 2012a). The population density in ASALs is low, ranging from one to two people per km² in parts of Turkana and Marsabit to 358 per km² in Kilifi (ibid.).

ASAL population growth has been relatively high compared with other parts of the country, as a result of in-migration and higher fertility rates (Republic of Kenya, 2012a). Migration from high-rainfall areas puts extra pressure on existing limited resources (Republic of Kenya, 2011a). The human population in Kenya's pastoral areas shows great dispersal, with many small settlements scattered across a large area. The changing socioeconomic environment has also encouraged the growth of a significant urban population, but with limited livelihood opportunities. This calls for the development of more off-farm income generation opportunities.

As a result of the increasing population, there is increased unplanned human settlement and cultivation in ecologically fragile areas and areas of relatively high agricultural potential, for instance Marsabit county (Republic of Kenya, 2014e). The urban population is also increasing: for example, the current urban population in Isiolo is 40% (Republic of Kenya, 2014a). Insecurity and conflicts are also contributing to people settling down in safer areas, for instance near security installations. There is also in-migration into ASALs as people from high-density agricultural areas move looking for arable land for farming.

Pastoral sedentarisation

Pastoral households that have been mobile in the past are now settling down into permanent enclosures. Several factors are driving this sedentarisation: trade centres are becoming attractive to pastoral dropouts looking for non-livestock-based livelihood options; declining range resources are making a pure pastoral system untenable; pastoral land has been alienated and converted into other uses; and policy is encouraging sedentarisation through the provision of food aid and other social services. An increasing number of pastoral populations are embracing petty trade or casual labour to supplement their income. However, the upcoming small towns in ASAL areas have been poorly planned and are unable to absorb the high number of immigrants without negative social and environmental repercussions.

Land use and tenure

ASALs in Kenya are dominated by nomadic pastoralism, semi-nomadic pastoralism and agro-pastoralism. Most of the land is communally owned (trust land), with only about 1% adjudicated (Republic of Kenya, 2014a). Areas that receive rainfall below 500 mm per year are predominantly pastoral; agro-pastoralism is practised in areas that receive between 500 mm and 900 mm of rainfall per annum (see Table 2). The amount of rainfall and soil fertility will determine the balance between livestock and crop production.

Wildlife conservation is another major land use, with the majority of national parks, game reserves and private/community conservancies based in ASALs. In northern Kenya, a trend of converting former group ranches into conservancies exists.

Over the years, ASAL communities have developed sustainable land use strategies, such as traditional grazing management systems, which have worked well under varying climatic conditions. However,

these strategies have proven to be inadequate in coping with the frequent natural calamities (e.g. droughts) that have faced ASALs. Although emergency responses following natural calamities have saved lives, they have failed to achieve resilience of pastoral households (Fitzgibbon, 2012).

A significant level of immigration into ASALs by non-pastoralists has influenced patterns of pastoralist settlement. Further, the 'permanent' emigration/exodus of pastoralist communities in response to disenfranchisement and privatisation of the land is also opening up other land use options. Unplanned settlements that depend on land use systems and technologies whose efficacy is not proven have further complicated pastoral livelihoods in ASALs. The ASAL ecosystems are therefore unable to cope with both the natural and the human-induced pressures that may undermine the sustainability of land resources.

There is an urgent need for land use plans that support sustainable development in ASALs. For these plans to work, a number of pertinent challenges will have to be addressed. First, ASAL communities will have to be prepared to change their conventional livelihood strategies so as to take advantage of existing opportunities. Second, they have well-developed and tested indigenous technical and social knowledge systems that will have to be integrated into the design of more sustainable land use technologies. Third, where communities opt to settle, settlement plans will have to be well planned so as to facilitate sustainable land use. Lastly, to ensure sustainable livelihoods, linkages will have to be created between ASAL livelihood systems and other national economic activities.

Planning for the more arid areas will involve addressing the challenges that limit efficient use of resources in such zones. These include artificial boundaries that curtail livestock movement during droughts; appropriation of dry season grazing

areas by farming communities; conflicts between pastoralists and other competing users; the exodus of young educated pastoralists from the traditional pastoral system; the breakdown of traditional lines of authority; and the destruction of the natural systems that maintain ecological balance.

Land use change interventions in arid areas should therefore strive to achieve improved water availability and reduced impacts of droughts; diversified products from the available land resources; improved market access for livestock products; improved access to social amenities; improved land tenure systems; improved security; and the empowerment of ASAL populations to access and utilise technologies.

For semi-arid areas, more research is required on appropriate technologies that can support dryland agriculture. Productivity in semi-arid areas could be improved through efficient water harvesting, storage and utilisation; use of appropriate technologies; integration of young skilled labour along the various value chains; and the empowerment of ASAL communities to access and utilise appropriate technology.

For lands with irrigation potential, there will be a need to carry out a more comprehensive characterisation of soil and water resources; more capacity-building of local communities in the application of irrigation technologies; and more diversification and selection of high-value crops whose income can cover irrigation costs.

By nature, ASAL lands function as both physical and social assets. As physical assets, these lands can be used for production. They also play a sociocultural role, as indigenous communities have developed social structures that not only facilitate production but also provide insurance to livelihoods and as coping strategies through various access rights granted to individuals by local institutions. Having a sustainable land use plan for ASALs will therefore entail interrogating the

“By nature, ASAL lands function as both physical and social assets. As physical assets, these lands can be used for production. They also play a sociocultural role, as indigenous communities have developed social structures that not only facilitate production but also provide insurance to livelihoods and as coping strategies through various access rights granted to individuals by local institutions.”

existing policies that govern land use, designing land use systems that are equitable, empowering the communities concerned to address areas of conflict in a more civil manner and promoting the development of strong institutions to govern and manage land resources efficiently.

Poverty

ASALs have some of the highest poverty levels and lowest levels of human development in Kenya, with over 60% of the population living below the poverty line (Mati et al., 2006). ASALs contain 18 of the 20 poorest constituencies in Kenya; some counties in the north, such as Turkana, Marsabit, Wajir and Mandera, have between 74% and 97% of people living below the absolute poverty line (Fitzgibbon, 2012).

These high poverty levels have been attributed partly to a historical bias in resource allocation: more resources were allocated to high-rainfall areas under the assumption that such areas would give better returns to investments than ASALs (Republic of Kenya, 2012a). Poverty in ASALs is more concentrated within urban centres among pastoral dropouts (Fitzgibbon, 2012). Although there is a general agreement among all the major stakeholders in ASALs that poverty levels are high, opinion differs when it comes to establishing reasons responsible for this. There is therefore a need to interrogate the underlying factors driving poverty.

Pastoral diets are changing to include an increased portion of cereals. The changing socioeconomic environment is making it increasingly difficult for pastoral households to subsist on a purely pastoral economy as household livestock ownership has declined (Krätli and Swift, 2014). Most pastoral societies are caught up in a process of societal differentiation whereby the social fabric that held the communities together is breaking down, giving room to more individual decision-

making (Republic of Kenya, 2004). Wealth differentiation among pastoral communities has been well documented and the gap between the rich and the poor continues to widen. As a few rich individuals get richer, many poor households are trapped in a vicious cycle of poverty.

The Kenyan government has proposed several policy actions that would help reduce pastoral poverty. These include expansion of social protection interventions, development of financial services in ASALs that include both human and livestock insurance, support to alternative livelihood strategies, use of education to reduce income disparities among social groups and empowerment of women (Republic of Kenya, 2012a).

Conflict management

For a long time, violent conflicts, clashes over land use and cattle rustling have undermined pastoral development efforts and wealth creation. Insecurity in ASALs has been a major cause of suffering and death and has curtailed access to large tracts of good grazing land. Conflicts in ASALs have been exacerbated by scarce resources; a proliferation of small arms in the region; unfavourable weather that necessitates migration; competition over resources among pastoralists and farmers in areas that were traditionally dry season grazing grounds; and sometimes poor or inappropriate conflict mitigation approaches. Some of the arid counties, like Garissa and Mandera, are also experiencing instances of insecurity perpetuated by terror groups, particularly the Al Shabaab group.

Conflicts will have to be addressed through identification of their root causes; supporting mobile herders in developing strategic grazing plans; encouraging and supporting indigenous conflict mitigation approaches; improving the capacity of security forces to respond; and investment in human capital development so more people in

ASALs can take up alternative livelihood options outside livestock production.

Gender

The changing socioeconomic environment in ASALs has had an impact on gender issues. Women are increasingly taking up more roles that used to be the preserve of men. For instance, men's role as household head and provider is now shifting to women as men migrate to take up paid work in urban areas. Therefore, in addition to the normal household chores, ASAL women have to take up an extra load of responsibilities that leaves them overburdened. At the same time, women still have limited rights of access to and ownership of economic resources. This limits their capacity to make decisions. Men working away from home do not adequately provide for their families, thus worsening poverty levels in such areas. Girl children still face discrimination when it comes to enrolment in formal education institutions and are also likely to be forcibly married off early.

There is a need to empower ASAL women through the provision of equitable access to basic services, especially education and health. Poverty is most severe among women, because of inequality, limited access to and ownership of land, lack of income-generating opportunities and isolation in essential economic services and decision-making (Republic of Kenya, 2004). Women need to be supported to access credit and other productive assets through relevant legislations and actions.

2.5 ASAL livelihood strategies

ASAL livelihood strategies fall into four broad categories and depend fundamentally on the livelihood assets discussed in Section 2.3: pastoralists and agro-pastoralists in sustainable grazing and cultivation; land use strategies related to sustainable extraction (dryland

Young Kenyan woman in the basket weaving business

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products such as gums and resins and charcoal/firewood); sustainable land use without extraction (such as ecotourism and tourism, cultural and aesthetic and other ecosystem services); and non-land-based enterprises such as entrepreneurship and trade and employment activities.

Sustainable pastoralism, agro-pastoralism and dryland agriculture

Pastoralism, agro-pastoralism and dryland agriculture are the key livelihood strategies adapted to climate conditions in ASALs. Pastoralism is a livestock-based production system. The contribution of ruminant livestock to national agricultural production has been underestimated in the past. According to Benkhe and Muthami (2011), the economic contribution

stands about 150% at Ksh 319 billion (\$3.8 billion) which higher than previously thought., An estimated 70% of cattle (12.2 million heads), 87% of sheep (14.3 million), 91% of goats (25 million) and 100% of camels (2.9 million) of the national livestock population are found in ASALs (ibid.) (Table 3).

As a means of adaptation, pastoralists keep a variety of animals – a mixture of cattle, donkeys, sheep, goats and camels – which allows them to take advantage of a diverse range of resources. Goats and camels are browsers and so do not compete directly with cattle, sheep and donkeys for feed. The livestock mix is determined by climate, vegetation, soil type and type of ethnic community. This ability of pastoralists to keep a variety of livestock species makes it possible for them to keep a relatively high

livestock population, a strategy of herd maximisation that ensures that, in the event of a catastrophe, at least a few animals survive.

Pastoralists are not homogenous groups but are located on a continuum between mobile and sedentary pastoralism. Mobile pastoralists occupy the drier parts of the country whereas the sedentary groups occupy relatively wetter areas. Mobility allows pastoralists to access range resources (especially water and pasture) that vary over time and space.

Agro-pastoralists lead a more sedentarised life and have at the same time taken up crop production. Immature crops are converted into livestock feed when the rains fail. Large livestock herds usually cushion agro-pastoralists against the adversities of droughts when they are desperate for food. Tasks in

Table 3: The contribution of livestock to the Kenyan economy

	Total population from 2009 Census	ASAL population	Highland population
Cattle	17,467,774	12,155,974 70%	5,311,800 30%
Sheep	17,129,606	14,354,925 87%	2,174,681 13%
Goats	27,740,153	25,250,865 91%	2,489,288 9%
Camels	2,971,111	2,968,670 100%	2,441 0%

Source: Adapted from Behnke and Muthami (2011).

agro-pastoral households are highly gendered, with women taking up most of the crop production activities as men move with livestock in search of water and pastures.

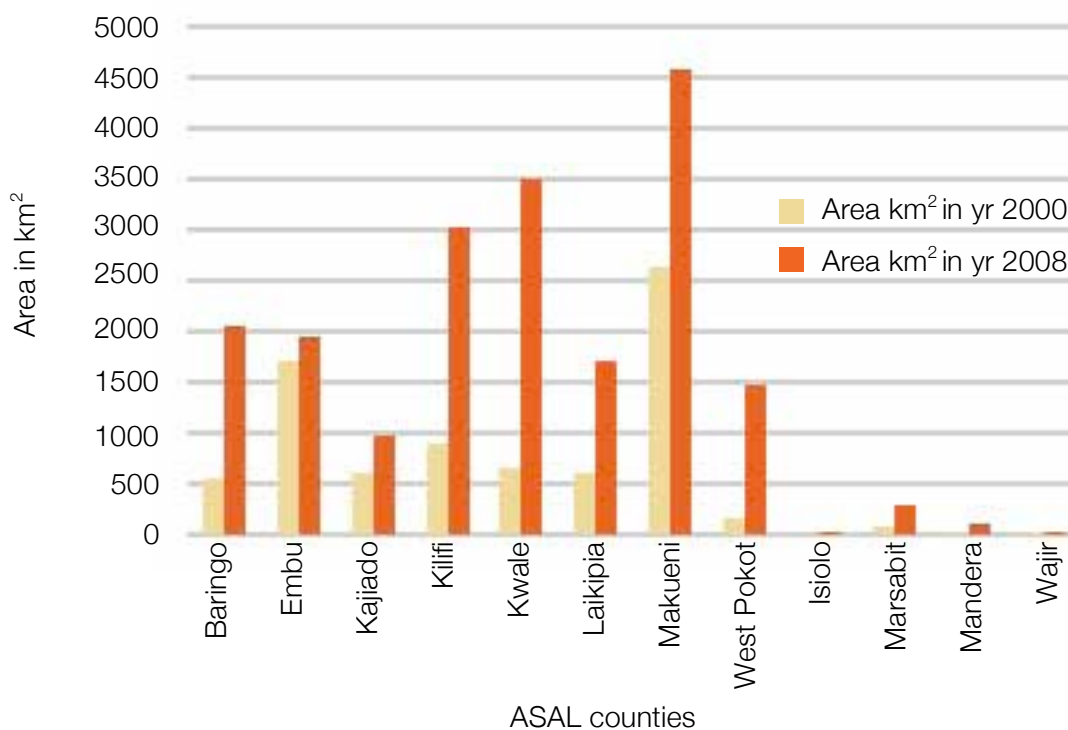
Agro-pastoralists usually use revenues from the sale of surplus crops to increase their livestock herd. They use these herds strategically to ensure food security and development. They have been known to engage in opportunistic crop production practices in moist valley bottoms or dry season grazing areas. This is a potential source of

conflict during the dry season, and it is always good practice to enforce existing traditional grazing norms/by-laws regulating water access rights for both pastoralists and agro-pastoralists during such times.

Trends in semi-arid lands point to further conversion of land previously not under agriculture to agricultural use (Figure 3). This is an indication of the growing importance of crop agriculture as an adaptation measure. Loss of livestock through drought, among other factors, and chronic food insecurity are some of

the driving forces behind increased farming activities in ASALs. Some of those dropping out of pastoralism are now engaged in small-scale irrigation agriculture, especially along rivers, as a means of attaining household food security. The appropriateness of irrigation agriculture in such fragile environments needs careful consideration to make it possible to strike a balance between food production needs and maintaining ecological resilience.

Figure 3: Trends in the expansion of agricultural land use in Kenya's ASALs



Source: Derived from data available on <http://landsat.usgs.gov/>

Livelihood strategies dependent on sustainable extraction of natural resources

Some other livelihood strategies include the potentially sustainable extraction of fuel wood and the charcoal trade. Sustainable wildlife utilisation (subsistence hunting) and trade in dryland products such as honey (bee-keeping), gums and resins are among common livelihood strategies in ASALs. Wildlife game-ranching and emerging livestock-keeping (e.g. ostrich farming) are also relevant in ASALs. Pastoralists inhabiting areas next to water masses may practise fishing. In Kenya, fisherfolk are found along the Tana and Athi Rivers; Lake Baringo and Lake Turkana support fisherfolk in drier areas. Fishing in pastoral areas has been facing some challenges, the major ones being diminishing stocks in natural water bodies as a result of high siltation levels and low productivity (Republic of Kenya, 2004).

Mineral and mining activities provide significant and emerging livelihood options for ASAL communities. The recent discovery of substantial oil, coal and gas deposits is likely to diversify livelihoods among ASAL communities. Other mineral exploitation activities include sand-harvesting, gravel-digging, prospecting for gold and precious stones, marble-quarrying and titanium, limestone and soda ash mining.

Mining activities provide substantial revenues to the national economy, in addition to opportunities for employment. The contribution of minerals is estimated at 5% of gross domestic product (GDP), with initial estimates from various experts indicating that Kenya holds approximately \$64.2 billion worth of rare earth.³ However, if not well set out, mining and quarrying can have negative effects on the environment as they may lower water tables and

cause pollution, among other environmental problems.

Sustainable land use without extraction (non-consumptive uses)

It is estimated that about 70% of wildlife in Kenya is found outside the protected areas in pastoral areas.⁴ Wildlife is a key tourist attraction in Kenya and tourism is a major foreign exchange earner for Kenya. With the right incentives, the number of wildlife outside the parks can be increased, thus increasing the contribution of tourism to the Kenyan economy, which stands at about 12% (Valle and Yobesia, 2009). This makes pastoral areas key to wildlife conservation. This has sparked rapid growth in community-based conservancies in pastoral lands. These community conservancies provide an incentive for the sustainable management of biodiversity resources, by linking their maintenance with poverty alleviation or livelihood benefits for the people living in their vicinity. The locals now perceive wildlife as a benefit rather than a menace given the associated benefits, such as employment opportunities in ecotourism, establishment of social amenities, improved security and school bursaries for their children, among others (Komu, 2013).

Despite the observed growth and benefits of these conservancies, some challenges are imminent, which questions the sustainability of these fragile ecosystems. Communal land tenure is no longer a preference for many pastoralists. Individual land ownership is highly preferred, with intentions of cultivation and other land uses incompatible with wildlife conservation. Unequal benefit-sharing spurred by the ever-increasing human population, triggering thoughts of dissolving the conservancies, has also been reported (Komu, 2013). Increased wildlife and droughts have also been perceived as contributing to the

reduction in pastures and grazing land.

Non-land-based livelihood strategies

Trade and market access opportunities with non-ASAL populations and upcoming opportunities for dryland agriculture based on new technologies such as hydroponics are among the alternative livelihood strategies available in ASALs. Opportunities are also emerging in urbanising ASAL communities as well as growing employment in non-livestock sectors such as the mining and services industries. The empowerment of ASAL communities with new skills and functional education is creating new opportunities outside the livestock and non-farming sectors.

³ <http://www.businessdailyafrica.com>

⁴ <http://www.kws.org/partners/index.html>

3. Climate situation in Kenya

Long-term rainfall and temperature trends are strong indicators of climate change and climate variability in the drylands and therefore influence rainfall effectiveness for pasture growth and water distribution for the survival of people and animals. This section presents an overview of the evidence of climate change and variability, followed by a discussion on the observed impacts of climate change in ASALs.

3.1 Rainfall and temperature trends in Kenya

Rainfall in Kenya is highly variable across different regions, with the ASALS seeing high spatial and temporal variability. Future projections of total annual precipitation suggest increases by approximately 0.2-0.4% per year, with regional variations in precipitation vast: the coastal region is likely to become drier while the

highlands and northern Kenya are likely to become wetter (Herrero et al., 2010). A key observation is that rainfall has become irregular and unpredictable, with more intense downpours (Nzau, 2003). Wet extremes/high-rainfall events that occur once every 10 years are projected to increase while dry extremes are projected to be less severe, at least in the northern parts of the country (Herrero et al., 2010).

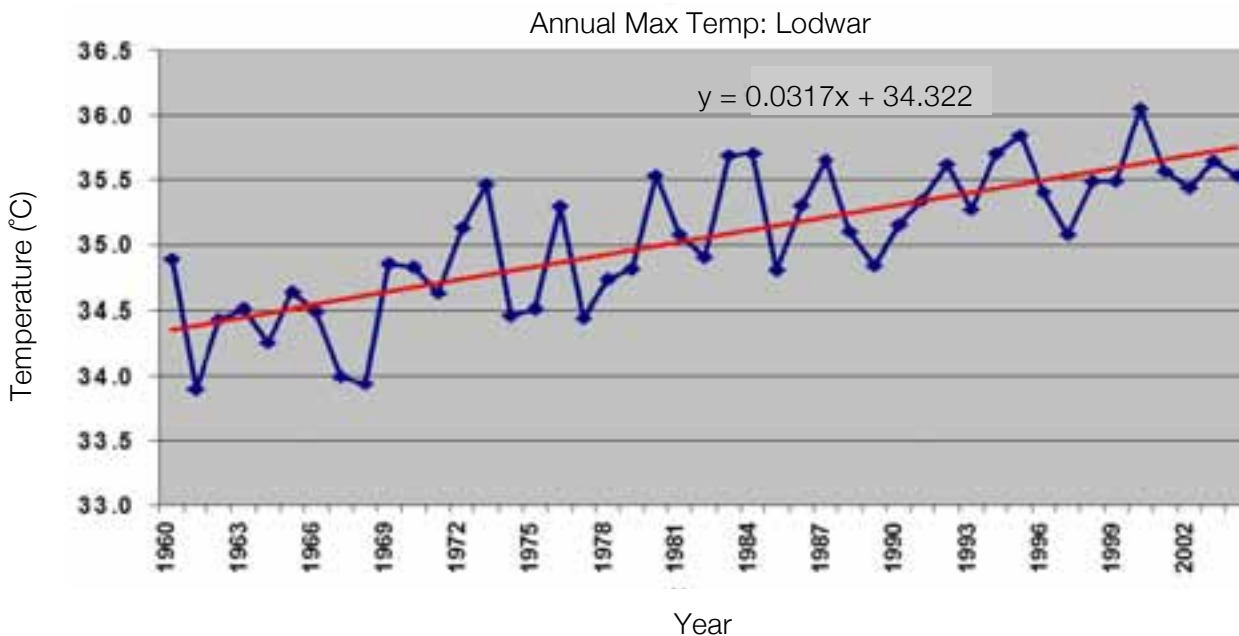
According to Parry et al. (2012), changes in rainfall patterns in Kenya have been noticed since the 1960s, although no statistically significant trends have been observed at the national level. Parry et al. further note that, at the subnational level, greater rainfall has occurred during the short rains of October to December, particularly in northern Kenya's ASALs, but local observations suggest the long rains of March and April have become increasingly unreliable, for example in the ASALs of eastern Kenya, with more intense rainfall along the coast.

Climate trends in Kenya have been marked by increases in both the minimum and the maximum temperature. It is reported that the minimum temperature has risen by 0.7-2.0°C and the maximum by 0.2-1.3°C, depending on the season and the region (Mutimba and Wanyoike, 2013). A trend of increasing mean maximum temperature has been observed (1960-2002) in Lodwar, Turkana county (Figure 4).

3.2 Evidence of climate change in Kenya

Evidence of increasing climatic instability in Kenya manifests itself in more frequent and intense weather extremes. For instance, the country has suffered a series of droughts and floods, which have had devastating socioeconomic and environmental impacts. A chronology of the droughts in Kenya from 1981 to 2011 (Table 4) indicates that their frequency has increased. In the past decade,

Figure 4: Temperature change in Lodwar, Turkana, northern Kenya



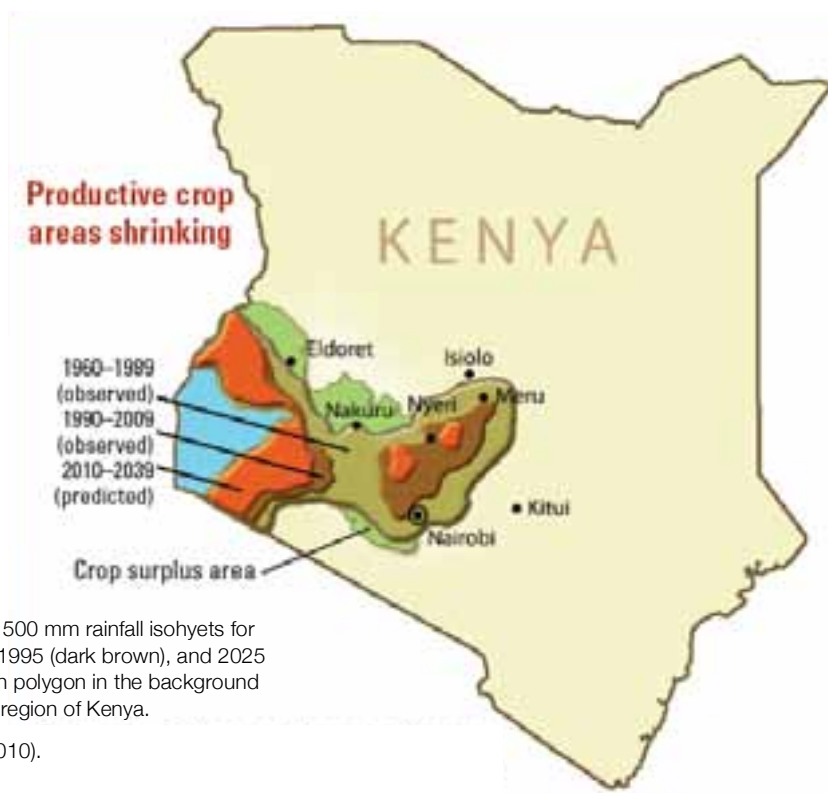
Source: Fitzgibbon (2012).

Table 4: Chronology of droughts in Kenya since 1981

Date	Region	Remarks
1981-1983	Countrywide	Severe food shortages in Eastern province, less in Central province
1984	Central, Rift Valley, Eastern and North-Eastern provinces	Moderately severe in Eastern province, relief food imported
1987	Eastern and Central provinces	4.7 million people dependent on relief, power and water rationing
1992-1994	North-Eastern Central and Eastern provinces	
1999-2000	Countrywide except Western province and coastal belt	

Source: Adapted from UNDP (2005).

Figure 5: A climate trend analysis of Kenya



Note: Average location of the 500 mm rainfall isohyets for the years 1975 (light brown), 1995 (dark brown), and 2025 (predicted, orange). The green polygon in the background shows the main crop surplus region of Kenya.

Source: USGS and USAID (2010).

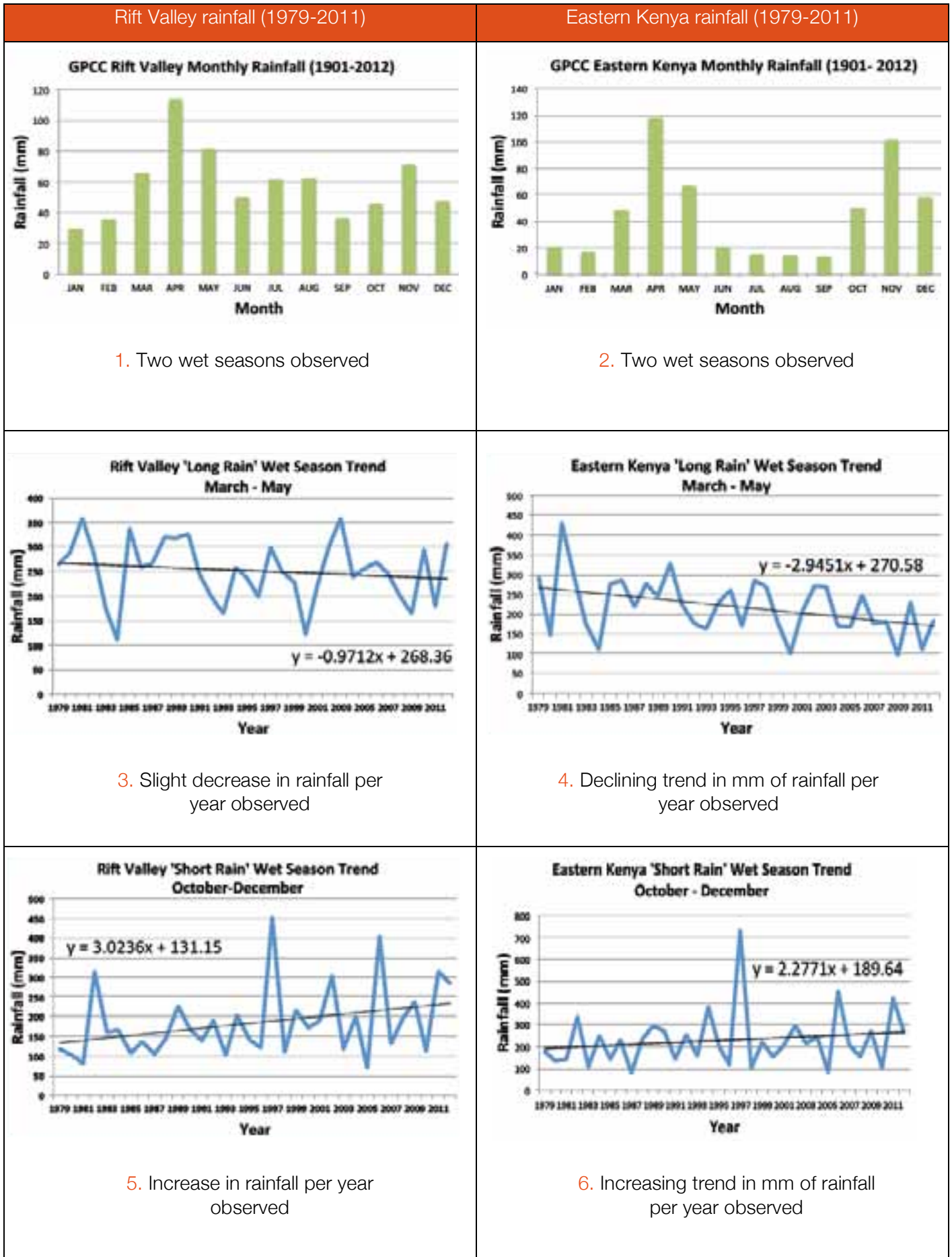
drought episodes were experienced in 2001, 2003, 2006, 2009 and 2011.

Analysis of rainfall and temperature data trend estimates (1960-2009) for Kenya by the US Agency for International Development's (USAID's) Famine Early Warning System Network (FEWS NET) clearly indicates consistent patterns of observed climate change during the 1960-2009 era in rainfall (Figure 5) and temperature data (USGS and USAID, 2010), key observations

being drying trends. Further, extending the observed 1960-2009 changes out until 2025 means large parts of Kenya will have experienced more than a 100 mm decline in long-season rainfall by that date, which other projections support (ibid.). Actual observed temperature trends indicate notable warming, which is consistent with the Intergovernmental Panel on Climate Change (IPCC) temperature scenario for eastern Africa (ibid.).

Another source of evidence of climate change in Kenya comes from analysis of rainfall and sea surface temperatures. This shows a slight decline in rainfall in the long rainy season (March-May) and increased rainfall in the short rainy season (October-December). This implies ASALs may face increased challenges in the agriculture and livestock sector as rainfall patterns become less reliable across eastern Kenya over the Rift Valley (Slides 3 and 5 in Figure 6) and eastern Kenya (Slides 4 and 6 in Figure 6).

Figure 6: Rainfall and sea surface temperatures in eastern and western Kenya



Source: <http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1255&context=star>

3.3 Impacts of climate change and variability in Kenya

Over 90% of disasters in the IGAD sub-region are climate-related (UNISDR, 2005; WCRP, 2011). The ASALs are prone to both droughts and floods despite the low rainfall they receive. Kenya experiences major droughts every decade and minor ones every three to four years; flood events are also common in ASALs when rainy seasons become extremely wet (Herrero et al., 2010). Climate-induced key socioeconomic and ecological impacts are discussed below.

Socioeconomic impacts

Kenya has faced various types of disasters, including fires, droughts, floods, terrorism, technological accidents, diseases and epidemics (Republic of Kenya, 2009), with more than 70% of natural disasters resulting from extreme climatic events (Parry et al., 2012).

Climate change and variability have had a negative impact on Kenya's economic growth. The economic impacts of climate change in Kenya across sectors are estimated to range from \$1 to \$3 billion per year (Republic of Kenya, 2010a). Kenya experiences frequent climate

extremes related to drought and rainfall that threaten sustainable development and livelihoods dependent on climate-sensitive resources (KIPPRA, 2013), particularly rain-dependent livestock and crop production. For instance, Kenya's economy relies significantly on agriculture (about 26% of GDP) (ibid.), which is adversely affected by climate change and variability, hence there is a close relationship between drought events and GDP growth in Kenya.

During the severe drought of 2011 in Kenya, the combined economic impact of the drought and related shocks was estimated at approximately 0.7-1.0% of GDP (World Bank, 2011), with the overall effects of the 2008-2011 drought estimated at Ksh 968.6 billion (\$12.1 billion) (Republic of Kenya, 2012b). Kenya's economy is therefore sensitive to climatic variations, as Figure 7 shows, depicting a close relation between drought events and GDP growth. The challenge facing the ASAL ecosystem is how to enhance the resilience of communities whose livelihoods depend entirely on climate-sensitive resources.

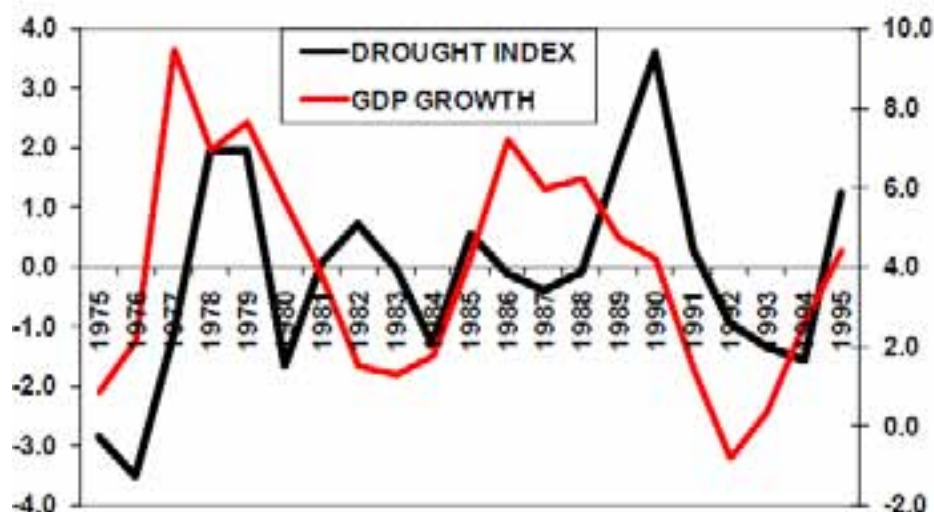
Compared with high-rainfall/humidity areas, ASALs are likely to be more severely affected by drought events

and are also characterised by low human development and high vulnerability, as shown by high levels of poverty, among others factors. Severe droughts are normally followed by severe humanitarian and food crises, which necessitate the provision of food relief, medical supplies and water to affected communities and households.

Drought and other climatic shocks have had significant impacts on national GDP, as the government allocates extra funds to manage crises and impacts arising from climate-related shocks caused by drought and floods. In Kenya, droughts cost an estimated 8.0% of GDP every five years (Parry et al., 2012). Further, extraordinarily high food and fuel prices are reported during droughts. For example, during the severe drought of 2011, staple food prices (June 2010-June 2011) rose by 51% in Kenya; diesel prices rose by 30% (CRS, 2012). This greatly reduced the purchasing power of affected households in the food-deficit pastoral and agro-pastoral areas.

Insecurity and conflicts have been reported to escalate during drought periods in ASALs. Security remains problematic – particularly in pastoral districts – partly driven by competition over declining grazing

Figure 7: Linkage between Palmer Drought Severity Index and GDP growth, 1975-1995



Source: Herrero et al. (2010).

and water resources and also because of the spillover effects of long-term instability in Somalia. For example, resource-based conflicts are common between the pastoral Ormo community and Pokomo farmers along Tana River as the two compete for scarce water resources and as the pastoral community seeks access to grazing resources.

Drought impacts and human conflict have in the past led to displacement/migration of populations within Kenya and across national borders, especially migration into Kenya from Somalia and Ethiopia. Declines in crop and livestock productivity owing to climate change mean reduced availability of food for households. Lack of and expensive food mean affected people move to towns in search of employment in order to get cash to buy food; some also move to towns in the anticipation of benefiting from humanitarian programs. Inter-clan and inter-tribal conflicts are creating *ad hoc* settlements in ASALs to access famine relief and security. There is also migration of refugee population to camps. For example, the Daadab

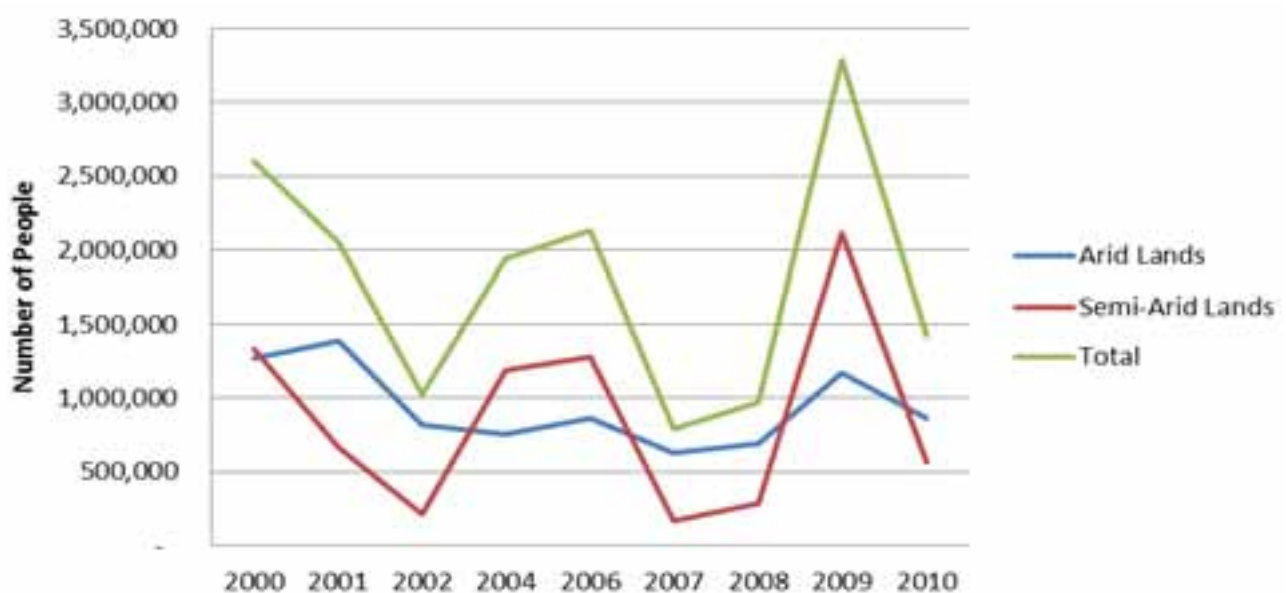
and Kakuma refugee camps in northern Kenya host over 500,000 refugees (Fitzgibbon, 2012).

Climate change has also had differentiated impacts on gender, particularly on women and other vulnerable groups. For instance, climate change has necessitated serious shifts in gender roles whereby women, previously viewed as vulnerable and in need of care and protection, are now playing key roles in ensuring the survival of their families (Njoka, 2011). With the depletion of livestock and with some men migrating to other areas in search of either pasture or wage employment, women have been thrust into becoming heads of households, with all the accompanying responsibilities. Also, drought is likely to have more impacts on girls and women since they are the traditional water and firewood collectors and hence are affected disproportionately compared with men. However, men bear the risk arising from conflicts related to competition for pasture and water resources for livestock, which is common during droughts (ibid.).

High levels of unemployment and few opportunities to generate income mean youth, especially young men, are challenging traditional power and decision-making systems, which have previously resided with elderly men. Some of these young men have been involved in inter- and intra-community cattle raids; others are getting caught up in other anti-social vices (Njoka, 2011).

The cyclical nature of drought disasters and incomplete recovery from the climate-related impacts of drought mean some households have become increasingly vulnerable, losing their ability to spring back. The implication of this is prolonged and increased dependence on relief and humanitarian support, which undermines the resilience of such households and communities. The latest severe drought in 2011 affected over 3 million people and trends over the past few years indicate that a significant number of people in ASALs have relied on assistance, as Figure 8 shows (Fitzgibbon, 2012).

Figure 8: Pastoralists, agro-pastoralists and agriculturalists assessed as requiring emergency food assistance



Source: Fitzgibbon (2012).

Ecological impacts

Drought has had diverse ecological impacts on the ASALs in the Horn of Africa. An acceleration of ecological deterioration is being witnessed, characterised by increasing loss of vegetation cover in some areas, land degradation through soil erosion,

fragmentation and destruction of wildlife habitats and degradation of water catchments as humans and livestock strive to cope with drought (Njoka, 2011).

Also, given high poverty levels in ASALs and in order to cope with drought and climate change impacts, the poor resort to survival/livelihood

strategies such as cutting down indigenous trees to burn charcoal for sale to urban centres and the cultivation of marginal and fragile land, which aggravate environmental destruction (Republic of Kenya, 2004).



A river during drought

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4. Review of past experiences, with special references to drought impacts and interventions

A review of past experiences indicates that humanitarian interventions have dominated the development approach, leading to more vulnerability and hence worsening adaptive capacities among ASAL communities. A new development paradigm is required to bridge the gap between relief interventions and long-term development for climate resilience-building. This review therefore also focuses on the identification of challenges and lessons for strengthening a climate-resilient development approach.

4.1 Transition from humanitarian interventions to long-term development

Droughts are the most common natural hazard in Kenya. As such, both the government and development partners have undertaken a flurry of interventions, both humanitarian and development in nature, mostly to alleviate the consequences of such droughts. Despite these efforts, the number of people and the extent of economic loss as a result of drought continue to increase, and some investments have undermined livelihoods. The trend has in fact been an increase in the number of people dependent on relief, poverty levels and vulnerability to drought and climate change impacts.

Evidence already shows emergency interventions cost more than would preventive measures for reducing vulnerability to drought (Fitzgibbon, 2012). There is consensus among observers and development actors on the need to re-examine past and on-going development and humanitarian interventions to enhance resilience to drought, for example by exploring links between

relief and long-term development (Njoka, 2011). This could help generate a strategy for enhancing long-term resilience and building sustainable livelihoods.

Kenya's 10-year Ending Drought Emergencies programme (2012-2022) therefore aims to create a more conducive environment for building resilience to drought, the focus also being strengthening the link between relief and development through a long-term approach (Republic of Kenya, 2011c).

4.2 Strategic interventions for enhancing livelihood resilience

Through stakeholder consultations and experiences/lessons from past interventions, a number of strategic interventions have been identified as key in promoting long-term development and enhancing household and community resilience to drought and climate change impacts. Key areas of investment include natural resource management and environmental protection; livestock-based enterprises; promotion of alternative livelihoods; and institutional capacity-building targeting the creation of resilience, among others. The role of the public sector, for example in creating a conducive environment (policy, infrastructure), is a key enabling factor.

Proposed interventions by the Kenyan government that in our view contribute to resilience pathways and the ending of emergencies resulting from recurrent droughts include:

- Water resources management: improvements to the harvesting and management of water in the rangelands/drylands, as well as

the integration of water and land management;

- Promotion of pastoral mobility and increased access to water and grazing resources, for instance through conflict prevention, management and resolution mechanisms;
- Development of climate-proofed infrastructure, targeting priority roads that link markets and producers;
- Building human capital through increased access to services, mainly education and health;
- Alternative livelihoods: upscaling of successes in alternative livelihoods in ASALs, particularly through financial services and business support, for example community-based credit such as revolving funds/village cooperative banks to provide investment capital for small and medium enterprises;
- Marketing opportunities: opportunities for livestock marketing (within Kenya and beyond) and dryland plant products have been identified, supported by market value chain analysis. There is high demand for livestock and livestock products in Kenya and the Horn of Africa region, given the growing population. In essence, it is vital to support the increased engagement of pastoralists and smallholder farmers in markets, for example through marketing cooperatives and livestock marketing associations;
- Food security measures: irrigation to increase production and to promote the adoption of drought-tolerant crops, post-harvest management and storage up to the community/village level and

promotion of indigenous nutraceutical herbs to support traditional coping strategies.

4.3 Challenges from past development interventions in ASALs

Review of past interventions to end drought emergencies and enhance resilience in the Horn of Africa identified some of the constraints to pursuing resilient livelihoods in ASALS (Njoka, 2011; 2012):

- Pastoral and agro-pastoral institutions are weak, with their effectiveness curtailed by internal governance weaknesses and lack of capacity to institute or enforce agreements/by-laws among members and ward off external aggressors, particularly in the face of changing political environments.
- Rampant corruption coupled with weak governance capacity has often resulted in the misappropriation of resources targeted at the development and humanitarian needs of the ASALS. The result is normally

failure to deliver, incomplete projects, wastage of resources and consequently very little or no impact on livelihoods.

- There is weak government presence in pastoral areas, particularly in northern Kenya; understaffing and limited resources affect service provision, for instance in animal health. This further constrains the role of the government as a facilitator and coordinator of development and humanitarian work.
- Policy reforms go at a slow pace, owing to vested political interests that delay or derail the legislative process. For example, several policies are still in draft form and have not been finalised, key among them the ASAL policy (the first draft was produced in 2004).
- Relevant government departments do not enforce policy. For example, environmental regulations enshrined in the Environmental Management and Coordination Act (1999) are rarely observed in

implementing projects, which results in negative environmental impacts that erode positive gains.

- Project design challenges arise from poor understandings of the drylands among some actors. For example, poor location of boreholes results in the abandonment or sedentarisation of pastoralists around water points, leading to environmental degradation.
- There has been a failure to integrate modern practices with indigenous knowledge, which implies a failure to build on people's knowledge and practices, such as by integrating modern early warning systems with traditional knowledge.
- Land tenure/access challenges exist, especially on pastoral land, which come under customary tenure. Where tenure is not clear, disputes arise over ownership and by extension over benefits associated with investments, particularly in natural resource management.

5. The policy and institutional context in relation to ASAL development

Various policy interventions since the colonial era in the 1920s, as well as post colonial-era policies and institutions, have shaped development in Kenya. Land degradation and poverty in ASALs have been among the challenges previous governments have attempted to address. This section briefly reviews various policies colonial and post-colonial governments have generated to address development challenges in Kenya.

5.1 Brief history of ASAL policy development in Kenya

The historical context of development approaches in Kenya's ASALs is vital to understanding the impacts of various government policies, programmes and institutional interventions. This section therefore represents a brief exposition of the policies and development approaches in ASALs, dating back to the pre-colonial period. It demonstrates the progression of the policy environment towards climate change-responsive policies and strategies in Kenya.

Colonial ASAL development approach (1900-1964)

Before the colonial era in 1900, pastoral livelihoods stretched in vast territories, which now come under sedentary agro-pastoral and rain-fed agriculture. During the colonial era, the British declared all land as being under the Crown, and consequently land was alienated for settling soldiers after World War I in 1918. The pastoralists were perceived to be warlike and the colonial government adopted a pacification policy that led to their non-integration in the national economy and marginalisation in social development. The colonial government also initiated the African Land Development Programme, which coordinated development of ASALs, following concern regarding

widespread land degradation and the breakdown of traditional livestock- and agriculture-based livelihoods.

During this period, the colonial government initiated grazing control, establishment of disease quarantines and livestock destocking programmes, but all these interventions were unpopular with the pastoralists. The 1954 Swynnerton Plan for the intensification of agriculture established grazing schemes in pastoral areas (with the administration enforcing destocking without the participation of the target communities).⁵ The plan seemed to work for densely populated high-rainfall areas but land degradation in ASALs continued unabated.

Post-Colonial ASAL development approach (1964-1980)

Kenya attained independence in 1964. The grazing schemes were quickly abandoned and replaced with a group ranch development model in semi-arid areas and grazing blocks in more arid zones (Republic of Kenya, 1968). The government pursued an economic integration strategy, which aimed at transforming nomadic pastoralism to commercial ranches for supplying meat for export outside the pastoral zones (ibid.). During this phase, there was investment in water development, stock route development and stratification of the

production system strategy, whereby young stock from more arid zones were sold to commercial and group ranches for fattening before slaughter.

It soon became clear that divergent expectations between the pastoralists and the government meant the former did not support the economic integration development approach. The pastoralists kept their livestock not only for economic reasons but also because of other sociocultural values and food security concerns. By 1977/78, the strategy of transforming subsistence pastoral livelihoods into commercial livestock production systems was abandoned and many development partners were seeking an alternative development strategy. In 1979, the government formulated the first-generation comprehensive ASAL policy (Republic of Kenya, 1979).

First-generation ASAL policy (1980-1992)

This first-generation ASAL policy, named 'Arid and Semi-arid Land Development in Kenya: A Framework for Implementation, Programme Planning and Evaluation' (Republic of Kenya, 1979) supported a district-based area development approach with the following objectives: development of human resources; exploitation of the productive potential of ASALs; natural resource conservation; and integration of ASALs in the national economy.

⁵ http://en.wikipedia.org/wiki/Swynnerton_Plan

Lessons learnt from ASAL development projects from 1980 to 1992 showed that:

- There was inadequate and poor quality of data on individual projects;
- No baseline survey was conducted;
- The head offices of line ministries did not accept the district-level planning approach;
- The ASALs had a poor technological base to facilitate off-take of any viable project;
- Human factors hampered ASAL development;
- There was poor coordination among implementers and funding agencies
- There was a lack of effective community involvement;
- The ecological diversity of ASALs posed challenges in terms of the utilisation and management of natural and land resources;
- There was a need for clear policy guidelines to handle the wide-ranging ASALs characteristics.

These lessons and experiences informed the formulation of a more comprehensive second-generation ASAL policy in 1992.

Second-generation ASAL policy (1992-2002)

This second-generation ASAL policy underpinned the potential of ASAL development, although the economic returns were much lower compared with in higher-rainfall ecological zones (Baxter, 1991). The policy also identified that the communities that were the poorest and the most vulnerable to natural disasters were mainly in the ASALs and therefore there was a need to consider the issue of social justice in allocations towards ASAL development. In addition, the environmental degradation witnessed in ASALs demanded constant attention: increasing desertification was set to lead to food insecurity and malnutrition.

Strategies to achieve the long-term objective of improving the living standards of the ASAL population by integrating ASALs into the mainstream of the national economy and social development in an environmentally sustainable manner were outlined based on lessons learnt from the first-generation ASAL experiences. These strategies included:

- Developing human resources and institutional capacities in ASALs;
- Strengthening community participation in the choice of development approaches;
- Enabling ASAL communities and institutions to apply low-cost and appropriate technologies;
- Diversifying traditional modes of production by introducing risk-minimising farming systems;
- Opening new avenues for communities, institutions and the private sector to engage in non-pastoral and off-farm activities;
- Reclaiming the land where damaged, protecting the diverse and valuable natural environment in ASALs;
- Improving the delivery of services in health, education and extension;
- Improving infrastructure, access to inputs and goods and output delivery channels as well as alternative energy supply systems;
- Strengthening district capacities and facilities in terms of drought prevention, intervention and recovery;
- Expanding and intensifying research linked to the sustainable development of human, economic and ecological resources.

The second-generation ASAL policy recommended areas of development interventions such as the integration of environment and development approaches; water resources development; social and community

“Unfortunately, the transition from single-party to multi-party politics during the 1990s slowed national development, especially given the withholding of funds by Kenyan development partners.”

development; livestock development; dryland farming; small-scale irrigation development; small-scale enterprise development; infrastructure; and drought management.

Unfortunately, the transition from single-party to multiparty politics during the 1990s slowed national development, especially given the withholding of funds by Kenyan development partners. In addition, some of the shortfalls of the second-generation ASAL policy were overemphasis on disaster management planning and prevention; lack of political will; poor visioning of the long-term outcome of ASAL development initiatives; failure of the policy to address the rising human population in ASALs; and vague land tenure policy in ASALs. Many of the good intentions articulated in the policy were later revisited in the new ASAL policy initiative under the National Rainbow Coalition (NARC) government (2002-2007).

5.2 Current ASAL development policy framework (2004-2012) relevant to climate change adaption and resilience-building

A more comprehensive ASAL development policy was drafted in 2004 through the efforts of the NARC government. After a lengthy political process, in 2012 Kenya adopted Sessional Paper 8, the National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands, (Republic of Kenya, 2012a).

Current ASAL policy

The 2004 draft policy's overall objective was, 'To improve the standard of living of the ASALs population by appropriately integrating ASALs into the

mainstream of the national economy and social development in an environmentally sustainable manner' (Republic of Kenya, 2004). The achievement of this objective will be guided by a vision for the next 15-20 years, during which ASAL communities will be facilitated to 'realize their social economic potential as a result of an enabling political and economic investment environment that supports sustainable development for enhanced wealth and employment creation'.

For the ASAL vision to be achieved, the government intends to ensure national planning adequately reflects the needs of poor people in ASALs. It will also support strategies to reduce the vulnerability of poor people to natural disasters and address issues related to governance and insecurity. Community participation in and ownership of development initiatives will be fostered to ensure long-term sustainability. Given past criticisms of uncoordinated ASAL development initiatives, the new vision will embrace 'connectedness', which will be reflected in social cohesion that supports poor groups; an economic development agenda that promotes wealth creation and employment opportunities; modern physical infrastructure; and the enhancement of good governance at all levels and especially at community level.

The new ASAL policy will support interventions that embrace the government's broad Pro-Poor Growth Strategy, which seeks to improve access to markets and market opportunities for the poor, enable economic growth and reduce the poverty and vulnerability of marginal groups in ASALs. Human capital development and employment generation in ASALs are high on the agenda of the new

government; the ASAL policy also reflects this.

The 2012 National Policy's goal is to facilitate and fast-track sustainable development in northern Kenya and other arid lands by increasing investment in the region and ensuring the use of these resources is fully reconciled with the realities of people's lives.

Besides addressing broad development issues, the new ASAL policy is specific on measures for the government to take to strengthen the climate resilience of communities in ASALs and ensure sustainable livelihoods. Measures to reduce the effects of drought and climate change on vulnerable communities in ASALs will include the following:

- Establish a National Drought Management Authority (NDMA) and National Drought and Disaster Contingency Fund (NDCF) and ensure timely activation of contingency plans to protect assets;
- Gazette and manage emergency drought reserve areas and encourage the development of buffer areas of crop and forage production as part of contingency planning;
- Mainstream climate foresight and climate adaptation into planning at all levels;
- Systematically strengthen the strategies communities use to adapt to climate variability and to reduce and manage the risks from natural disasters;
- Explore opportunities and develop appropriate mechanisms through which communities can benefit from bio-carbon initiatives.

EDE 2012-2022 will contribute to government efforts to implement the above policy (Table 5).

Table 5: Ending drought emergencies in Kenya – summary budget for 10-year action plan

Element	Indicative interventions	Estimated budget (USD)
Peace and security	Strengthen early warning, conflict resolution mechanisms and peace infrastructure at all levels. Capacity-building of police forces.	350,000,000
Humanitarian relief	Implement EHRP. Promote synergies between early warning and response. Link relief to development	741,050,000
Infrastructure	Climate-proof infrastructure – roads, multi-purpose dams, irrigation schemes, expanding water supply to ASAL communities, rural electrification.	764,200,000
Building human capital	Operationalise National Commission on Nomadic Education. Increase participation rates in training and education and access to health facilities.	305,000,000
Sustainable livelihoods	Effective management of water resources, seed bulking for pasture and forage, irrigated agriculture, value addition and marketing, social protection and assurance, livestock disease control.	38,600,000
Coordination and institutional framework	Sector-wide programme coordination.	115,900,000
National drought contingency (initial allocation)	Fund to be managed by Drought Management Authority for allocation according to district/county needs and priorities.	55,000,000
Total		2,369,750,000

Source: Fitzgibbon (2012).

National Policy for Disaster Management

Droughts, fire, floods, terrorism, technological accidents, diseases and epidemics dominate Kenya's disaster profile. The National Policy for Disaster Management (Republic of Kenya, 2009) endeavours to mainstream mechanisms for addressing disasters. It envisions a safer, more resilient and more sustainable Kenyan society, and its overriding principle focuses on

effective disaster management guided by principles of disaster prevention, mitigation, preparedness, response, recovery and reconstruction. More than 70% of natural disasters in Kenya are related to extreme climate events (droughts and floods) that are key causal factors in some emergencies that lead to disasters (Parry et al., 2012). The policy therefore articulates the need to factor climate into DRR and hence provides a good opportunity for

enhancing the long-term resilience of communities to climate disasters.

Climate policy and law

While the 2012 National Policy focuses mainly on ASALs, the government has now formulated a national climate change framework policy and climate change law to specifically address issues of climate change and sustainable development across the entire country. In September 2014, the draft National Climate Change

Framework Policy (Republic of Kenya, 2014c) was released. This seeks to address the link between sustainable national development and climate change, given the impact the climate has on various development sectors in Kenya. It aims to enhance adaptive capacity and build resilience to climate variability and change while promoting low-carbon development pathways. It recognises that ASALs are particularly vulnerable to climate change impacts and the measures proposed further reinforce the resilience-building objectives of the 2012 National Policy.

This latest effort is expected to consolidate sectoral policy measures into a comprehensive national policy for adaptation to climate change and resilience-building in Kenya. The policy legitimises and builds on the strengths of the 2010 National Climate Change Response Strategy, which has had no corresponding policy.

The latest policy interventions are proof of Kenya's commitment to addressing challenges related to climate risks. The translation of this effort into practice is a process and will require long-term commitment,

both politically and in terms of resource allocation at all levels of governance.

National Climate Change Response Strategy

Informed by the need to resolve climate change impacts that threaten socioeconomic development challenges, Kenya adopted its National Climate Change Response Strategy in 2010 (Republic of Kenya, 2010a). The strategy is also a commitment to the UN Framework Convention on Climate Change (UNFCCC), to which Kenya is a signatory. Its principal focus is ensuring adaptation and mitigation measures are integrated in all government planning, budgeting and development objectives.

The strategy proposes a raft of measures to curb the adverse effects of climate change, including integrated water resource management and use, livestock interventions and dryland agriculture. It provides a comprehensive framework for action in compliance with Kenya's Vision 2030 and the 10-year EDE.

Draft National Irrigation Policy

The National Irrigation Policy is in the final stages of parliamentary approval. It is informed by the reality that, for Kenya to be food-secure, the ASALs that constitute over 80% of its landmass should harvest and store rainwater for crop, livestock and industrial requirements. The vision of the policy therefore is, 'Efficient, sustainable and manageable irrigation schemes for prosperity, wealth creation and food security in Kenya' (Republic of Kenya, 2015). The policy will thus provide pathways to the climate-resilient development of semi-arid ecosystems. This also paves the way for public-private partnerships to enhance food security in the country.

Investment in irrigated agriculture is currently far below expectations, as demonstrated by the area currently under irrigation when compared with potential irrigable areas. The potential area for irrigation is estimated at 539,000 ha (Table 6). Only approximately 110,000 ha of the total potential has been exploited, or about 19%.

Table 6: Status of irrigated agriculture in relation to existing potential in Kenya's ASALs

Basin	Potential (ha)	Development (ha)
Tana	205,000	67,000
Athi	40,000	11,000
Lake Basin	200,000	10,700
Kerio Valley	64,000	5,400
Ewaso Ng'iro	30,000	10,000
Total	539,000	105,800

Source: Karina and Mwaniki (2011).

Challenges and opportunities under the Constitution of Kenya

The new Constitution of Kenya was promulgated in August 2010, making several provisions for the coupling of ecological and social systems. For instance, Article 69 (1) compels the state to ensure 'sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits' (Republic of Kenya, 2010b). The Constitution provides for the separation of functions between the central and county governments.

Challenges under the devolved governance system

In our view, implementation of sustainable land management under a devolved system of governance is likely to continue facing challenges in the following areas:

- Competition over natural resources owing to restriction of open access: cultural practices and weak traditional/local community institutions will require capacity-building for effective management.
- Non-alignment of ecological and administrative boundaries still remains a big challenge at community level and, under newly created county government systems, inter-community hostility is likely to increase in the short run, given shared cross-county grazing resources. For example, boundary disputes over resources have recently occurred between Mandera and Wajir; Turkana and West Pokot; and Marsabit and Isiolo, among others.
- The breakdown of community land rights to individual rights is a threat that is likely to degrade shared natural resources, resulting in diminishing ecosystem functions, especially in key production sites such as

wetlands and dry season grazing area.

Opportunities under a devolved governance system

The Constitution of Kenya recognises two layers of government: national and county. Article 174 lays out the stated objects of devolved government, with communities empowered to manage their affairs including natural resource management through democratic and accountable exercise of power. Article 174 (c) confers 'powers of self-governance to the people and enhance[s] the participation of the people in the exercise of the powers of the State and in making decisions affecting them' (Republic of Kenya, 2010b).

Some of the expected outcomes of this constitutional provision are direct financial support to strengthen community capacity/local governance by government to implement community decisions on natural resource management for equitable benefit-sharing and gender inclusion. Although government support and commitment are critical in ASALs, empowered community governance should ensure ownership and success of sustainable land management practices.

Article 185 (1) confers legislative authority at county level where laws and regulations regarding the sustainable management of natural resources and especially grazing management can be enforced (Republic of Kenya, 2010b). The county government will facilitate local community institutions to implement their laws and regulations on access to grazing resources as well as on how to manage community land to ensure optimal use of grazing resources.

In summary, the expected benefits of a devolved government system that can promote good governance for climate-resilient development and sustainable land management practices as per the current Constitution of Kenya include the following:

- A definition of land rights that confers community ownership and responsibility in sustainable land management practices;
- Empowerment of local governance structures/local institutions by the legislative powers of the county government;
- Equitable benefit-sharing from sustainable land management practices (community grazing schemes and conservancies);
- Implementation of co-management regimes likely to emerge or to be strengthened under national and county-level policies (community forest associations, water user associations, community conservancies, community wildlife services, community grazing schemes).

5.3 Other national policies relevant to climate change and resilience-building in ASALs

Other policies that have a bearing on efforts to promote climate change resilience actions are briefly discussed below.

National Policy on Peace Building and Conflict Management

The National Policy on Peace Building and Conflict Management (Republic of Kenya, 2011b) recognises there is a link between climate change and conflict. Some of the conflicts common in ASAL areas of Rift Valley, North-Eastern, Eastern and Coast provinces arise from competition for pasture and water during periods of drought and famine. Human-wildlife conflicts are also common in ASALs, especially because of habitat loss (such as that resulting from encroachment by farmers), degradation of wildlife areas and land fragmentation, which bring wildlife closer to humans. The



policy intends to promote prevention, mitigation and preparedness as means of addressing peace and conflict issues in Kenya. The proactive and conflict-preventive measures it advocates are critical to averting conflicts emerging as a result of climate shocks and stresses.

National Environment Policy

The National Environment Policy (Republic of Kenya, 2013c) sees climate change as a major environmental challenge and commits the government to promoting efficient adaptation measures for productive and sustainable resource management in ASALs. Issues related to climate adaptation in ASALs are now taken up under the comprehensive EDE (2012-2022). With regard to the climate change challenge, the government will conduct the following measures:

- Develop and implement a comprehensive National Climate Change Policy: this is now at an advanced stage, as earlier alluded to, with a draft National Climate Change Framework Policy developed in September 2014.
- Strengthen the capacity of national and county-level institutions to support national climate resilience and low-carbon development through integrating climate change into implementation strategies.
- Develop and implement awareness-raising strategies and capacity development on the opportunities for adaptation and mitigation measures as per the climate change action plan.
- Strengthen and enhance early warning and response systems for climate and disaster risk reduction.
- Build and strengthen research capacity on climate change and related environmental issues.

National Livestock Policy

The National Livestock Policy (Republic of Kenya, 2008) recognises the potential of ASALs in livestock production, and proposes as one of its measures the promotion of sound range management practices and effective disease control. This is a means of addressing challenges related to prolonged droughts that often lead to high livestock mortality, which makes socioeconomic recovery after drought difficult for the livestock owners.

National Land Reclamation Policy

The National Land Reclamation Policy (Republic of Kenya, 2013d) provides a basis for the development of guidelines for the efficient and cost-effective use of land resources by integrating reclamation, rehabilitation, restoration and remediation practices, in harmony with Vision 2030. It gives special attention to the ASALs given their fragility, thus strongly supporting one of the major challenges in ASALs – that is, land degradation/loss of key production areas, which undermines the ecosystems services on which many livelihoods depend on for survival.

National Land Policy (2007)

The focus of the National Land Policy (Republic of Kenya, 2007) is to secure rights over land and provide for sustainable growth, investment and poverty reduction. Although the policy alludes to no specific measures for climate change adaptation, it seeks to promote use of land-based resources in a manner that is economically and socially equitable and environmentally sustainable, consistent with some of the measures expressed in climate adaptation measures.

International conventions

As part of its regional and global responsibility, Kenya has

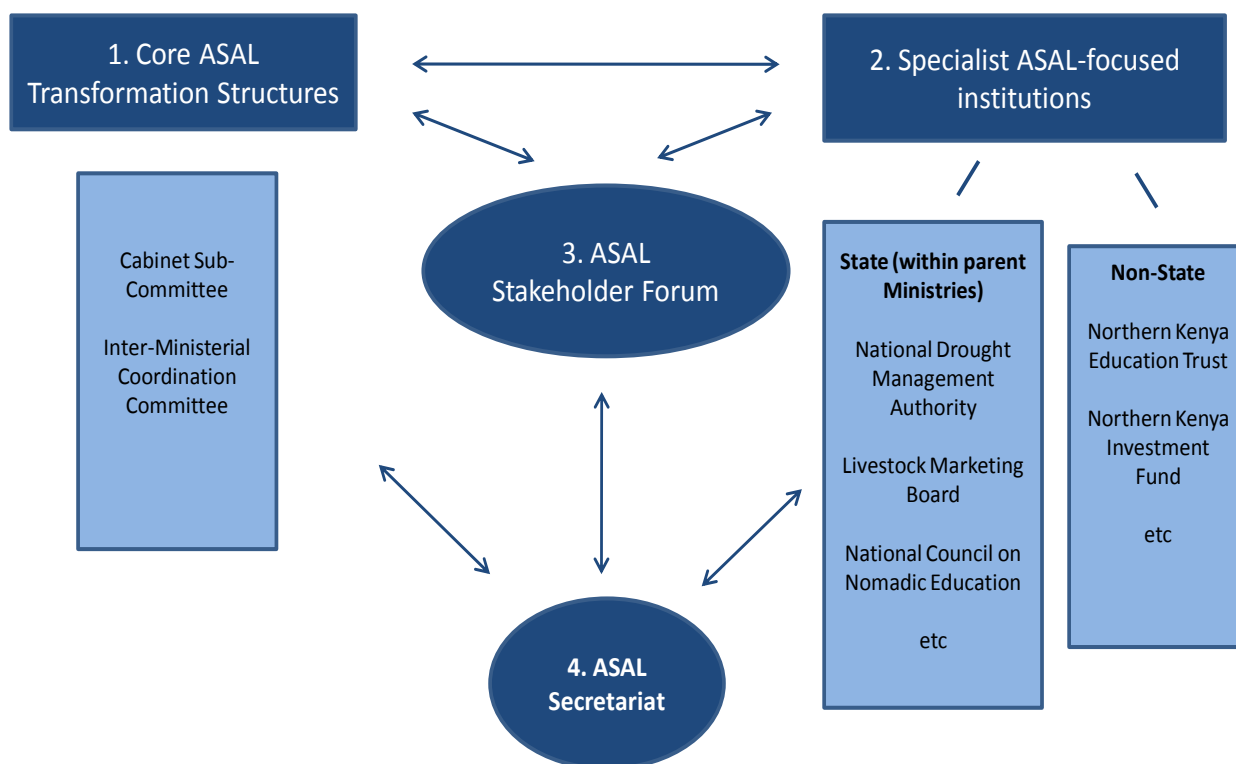
ratified/signed various environmental conventions and frameworks that have a bearing on climate change and variability. The most relevant ones are the UN Convention for Combating Desertification, the UNFCCC and the Convention on Biological Diversity. Relevant national action plans have been put in place to domesticate these conventions.

Kenya has also domesticated the Hyogo Framework for Action (HFA) for 2005-2015. HFA is an international strategy for dealing with disasters in order to build the resilience of nations and communities by shifting action from post-disaster responses to prevention and preparedness (UNISDR, 2005). The country has implemented HFA by adopting in its National Policy for Disaster Management DRR as one of the strategies to address climate-related disasters (Republic of Kenya, 2009). By establishing NDMA (in 2012), Kenya is seeking to strengthen the national and local (county)-level institutional framework to support local implementation of DRR.

5.4 Institutional framework for addressing climate change in Kenya

The National Policy on ASALs establishes an institutional framework for multi-sectoral and multi-stakeholder ASAL development (Figure 9). This implementation structure has been operationalised since 2012. The core transformation structures, such as the Inter-Ministerial Coordination Committee, have been established. The ASAL Stakeholder's Forum (ASF) has been held annually for the past two years. The ASAL Secretariat under the Ministry of Devolution and Planning, is in charge of overseeing ASAL policy implementation and ensures harmony in multi-sectoral interventions. NDMA is specifically mandated to facilitate the implementation of drought- and climate-resilient development as

Figure 9: Institutional framework for ASAL development



Source: Republic of Kenya (2013b).

outlined in the 10-year EDE (Republic of Kenya, 2013b).

National Drought Management Authority

The NDMA is a statutory body established under the State Corporations Act (Cap 446) of the Laws of Kenya by Legal Notice 171 of 24 November 2011.⁶ The government recognises that the key to effective drought management is to reduce risk and build resilience by investing in sustainable development in drought-prone areas and by mainstreaming risk reduction into processes of development planning and resource allocation. NDMA coordinates the preparation of risk reduction plans, undertakes risk reduction awareness and education and oversees the implementation of risk reduction activities.

NDMA has devolved to the counties by establishing offices headed by drought monitoring officers to assist

in preparedness and response to drought disasters. NDMA is also the national focal point for the IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI). NDMA is expected to mainstream drought risk reduction, climate change adaptation, social protection and EDE in planning and budgeting processes at all levels and invest in strategic activities that reduce drought risks and enhance drought preparedness at county level (Republic of Kenya, 2013c). The effectiveness of implementation of the new policies and programmes at county level is yet to be seen, though many ASAL counties have come up with County-based Integrated Development Plans, as this will also depend on the level of mainstreaming of national risk reduction and county human and technical capacities.

National Environment Management Authority

NEMA is a government para-statal established to exercise general

supervision and coordination of all matters relating to the environment. It is the principal government instrument in the implementation of all policies relating to the environment and the accredited national implementing entity of the Climate Change Adaptation Fund of the UNFCCC. It is responsible for vetting eligible projects for funding from the Adaptation Fund and overall management of projects and programmes in terms of financial, monitoring and reporting responsibilities.⁷

Ministry of Environment, Natural Resources and Water

The Ministry of Environment, Natural Resources and Water is responsible for policies and programmes aimed at improving, maintaining, protecting, conserving and managing the richness of Kenya's natural resources, including water, forestry,

⁶ <http://www.ndma.go.ke/>

⁷ <http://www.nema.go.ke>

wildlife and environment. Kenya Meteorological Services

KMS is responsible for the provision of meteorological and climatological services to agriculture, forestry, water resources management, civil aviation and the private sector, including industry, commerce and public utilities, for the better exploitation and utilisation of natural resources for national development. KMS conducts drought and flood monitoring to inform DRR strategies.

Agricultural Sector Development Support Programme

ASDP has taken over the role of the Agriculture Sector Coordination Unit (ASCU), and has been devolved to the counties (headed by ADSP county coordinators). It is mandated to facilitate effective coordination of sectoral agriculture-related sectors with respective sectoral ministries tasked with aspects of sustainable land management practices.

The following ministries constituted the agriculture sector under the coordination of ASCU: Agriculture; Livestock Development; Fisheries Development; Cooperative Development and Marketing; Water and Irrigation; Land; Natural Resources and Environment; and Regional Development. This demonstrates the importance of the coordinating role of ASCU as far as sustainable land management was concerned. ASDSP supports, among other things, value chain development in all 47 counties, in line with county priority value chains.

ASAL Stakeholders Forum

ASF is part of the ASAL transformation structures institutionalised in the 2012 National Policy on the Sustainable Development of Northern Kenya and Other Arid Lands. ASF is therefore expected to fast-track the National Policy to realise climate-resilient livelihoods for ASAL communities through equitable development.

ASF is a platform where non-state actors working in Kenya's ASALs can engage with each other, with potential partners and supporters and with both national and county governments to strengthen cross-sectoral and cross-agency coordination of development policy and practice.

5.5 Alignment of Kenya's ASAL policies with climate-resilient development

Kenya has experienced droughts and humanitarian crises for several decades, but the recent extreme drought of 2008-2011 in the Horn of Africa led to the rethinking of the long-term development approach integrating humanitarian interventions. A paradigm shift has occurred in relation to the development approach for ASALs to one that embraces climate-resilient development. Since 2012, IGAD member states and development partners have been promoting the alignment of ASAL policies to accommodate a climate-smart development approach for resilient livelihoods.

Alignment of Kenya's ASAL development with IDDRSI

Following the IGAD Summit on the Drought Crisis in the Horn of Africa in September 2011, Kenya prepared a Country Programme Paper on mainstreaming a climate-resilient development approach in line with the IDDRSI framework (IGAD, 2013a). Its strategies include measures to strengthen natural resource management; market access and trade; livelihoods and basic service delivery for ASAL populations; disaster risk management; conflict management; and research and knowledge management. Below is a brief assessment of these strategies:

- Natural resource management encompasses pasture, land and environmental management,

biodiversity, renewable energy, water resource management (e.g. efficient use of available water and multiple water solutions) and climate change adaptation and mitigation.

- A livelihood support strategy for resilience-building must pay special attention to the dominance of livestock-based livelihoods but at the same time expand the scope of alternative livelihoods based on non-livestock interventions. DRR is a challenge in safeguarding livestock-based livelihoods in ASALs.
- Conflicts will have to be addressed through identification of their root causes, supporting mobile herders in developing strategic grazing plans, encouraging and supporting indigenous conflict mitigation approaches, improving the capacity of security forces to respond to violent conflict and investment in human capital development so more ASAL people can take up alternative livelihood options outside livestock production.
- There is a great need to validate information through well-designed research that can generate an evidence-based drought resilience programme while providing internship to young professionals. In this process, knowledge management and communication tools will be developed for specific communities and localities.

Participation of regional and global partners in climate-resilient ASAL development

The IGAD Summit held in Nairobi in 2011 brought IGAD member countries and development partners together to discuss sustainable solutions to the Horn of Africa drought crisis. Several issues were agreed on, including the integration

of drought risk reduction and climate change adaptation into development planning and resource allocation and launching regional projects to address the underlying causes of vulnerability in drought-prone areas (EAC and IGAD, 2011). These issues are now informing IGAD member countries in the Horn of Africa on sustainable resilient pathways for ending drought emergencies and responding to climate-related disasters.

Countries and development partners have adopted the IDDRSI framework to enable climate-resilient development (IGAD, 2013b). In September 2011, the Inter-Agency Steering Committee Plan of Action was developed to support a humanitarian and development response to the crisis. This spells out a comprehensive strategy for humanitarian and development partners' engagement with national and regional counterparts to support and strengthen government-led plans to address the crisis in the Horn of Africa (IGAD, 2012).

Development partners led by USAID formed a Global Alliance for Action to support the IDDRSI framework for ending drought emergencies. For example, USAID launched Resilience and Economic Growth in Arid Lands in 2012 in Kenya to cover the northern Kenyan arid lands; the African Development Bank has also initiated a resilience-building programme; the European Union is implementing the Supporting the Horn of Africa Resilience Initiative as a joint humanitarian–development approach whose focus is on building resilience; and the new thrust of the World Bank's response to the 2011 drought crisis is to link short-term crisis mitigation with long-term development objectives at country and regional levels through implementation of the Global Facility for Disaster Reduction and Recovery and the State and Peace Building Fund (Njoka, 2012). Since drought is a crosscutting issue in ASALs, PRISE will also need to align its work with the IDDRSI framework.

5.6 Policy and institutional constraints to climate-resilient development

Over the years, Kenya has made significant progress in addressing policy and institutional challenges related to the development of ASALs. This has culminated in the National Policy for the Sustainable Development of Northern Kenya and Other Arid Areas and the establishment of NDMA, which is leading the process of long-term development in ASALs in the face of extreme climate events. However, some gaps and barriers stand in the way of the effective implementation of policies and the functioning of institutions. In addition, other sectoral policies should complement ASAL policy to realise climate resilience and sustainable livelihoods.

Policy gaps, bottlenecks and barriers

It is a major challenge for the national and county governments to implement the several policies that have been initiated. The harmonisation of issues related to drought disaster management and adaptation to climate change requires a new approach. It is incorrect to assume the general national development planning process will mainstream climate-resilient development. For example, food security policy in Kenya overemphasises the need for grain and until recently did not give much attention to livestock-based food security.

The legislative process for policy enactment is long and characterised by political intrigues that often delay the process. Currently, understanding of ASAL development in Kenya is largely based on competition for scarce national resources for equitable development that is benchmarked on high-rainfall areas. The development approach for high-rainfall areas where land has been fragmented into small parcels is not suitable for ASAL areas, where

landscape-level extensive land management is more appropriate for climate-resilient development. The debate on the right development approach for ASALs that is premised on economic returns to investments may account for the long delay on the approval of the draft ASAL policy of 2004, adopted in 2012 as the master plan for ASAL development in Kenya.

Although the activities of several government ministries (e.g. Agriculture, Livestock, Natural Resources, Water and Land) have a bearing on climate change, climate change adaptation measures are still to be mainstreamed in most sectoral policies. This is now being addressed through the new (2014) National Climate Change Framework Policy.

Another challenge is weak implementation of the Environmental Management and Coordination Act. For instance, the siting of water points and drilling of boreholes and other infrastructure in ASALs has in many instances been done without due process of assessing environmental and social impacts, leading to degradation that further undermines the resilience of communities to drought- and climate change-related effects.

Policymakers do not understand well the potential of cross-border sharing of resources and information for climate change adaptation. In addition, negative perceptions and unsupportive national policies hinder the exploitation of cross-border activities for enhanced livelihoods in ASALs.

Institutional gaps, bottlenecks and barriers

Past humanitarian and development interventions in ASALs have been characterised by weak coordination of actors and interventions. This has led to duplication of efforts, poor targeting of interventions and minimal impacts in terms of building the capacity of communities to cope with drought, floods and famine. Most development actors in ASALs

have been responding to drought- and climate change-related crisis using a short-term and rigid project-based approach (for quick results), lacking the flexibility to address long-term issues. Only recently have some actors embraced integrated development as a long-term approach.

Overall programming has not adequately addressed gender and generational biases leading to the exclusion of vulnerable groups, such as the failure of programmes to link activities and the needs of women and youth in responding to the challenges of climate change. There is limited capacity (human and financial) and knowledge among non-governmental organisations (NGOs), government officers and community leaders, among others, with regard to climate change-related approaches. This has led to a lack of mainstreaming of climate change adaptation in development plans. Weak partnerships, linkages and coordination among community-based organisations (CBO), NGOs, sectoral ministries and development partners have contributed to a lack of synergy and complementarity among actors, resulting in limited impacts in terms of improving community resilience to climate change and sustainability challenges.

Both human and financial capacities are inadequate to support new institutions at county level in the service delivery necessary for adaptation to climate change. For instance, agricultural/livestock extension services are highly constrained. Rampant corruption coupled with weak governance capacity has often resulted in the

misappropriation of resources targeted at development and humanitarian needs in ASALs. However, this situation is likely to change for the better under the new devolved government, given greater accountability and increased community oversight.

The current Constitution enshrines the recognition and protection of pastoral land (as community land). However, implementation of a devolved system of governance has triggered boundary disputes, as rangeland ecosystems transcend county and regional borders, and pastoral patterns of movement and resource utilisation do not necessarily respect administrative boundaries.

5.7 Summary of lessons learnt from the Kenya Country Situation Assessment

- Climate change impacts like drought are likely to aggravate resource-based conflicts, as Section 3 of this report revealed. For example, conflicts may well arise over scarce water and pasture, hence the need to integrate conflict management into drought mitigation strategies in conflict-prone areas. This is also true for long-term grazing management strategies in areas of shared resources, where neighbouring communities have to constantly maintain dialogue and negotiation to avoid conflicts over resources.
- Climate change impacts affect a wide area across borders, so effective drought risk management, currently based on

a geographic and thematic focus, must embrace an ecosystem-wide approach that borders and boundaries often constrain.

- The most effective interventions remain those that facilitate access to, control over and management of grazing and watering resources. This entails promotion and support of intra- and inter-community sharing and management of shared resources to enhance resilience to climatic shocks.
- Building community structures/institutions such as pastoralist associations greatly increases local capacity to manage droughts and respond to emergencies before external support arrives.
- Multi-stakeholder approaches to disaster management improve responses through increased funding and sharing of experiences and best practices in the management of drought cycle.
- Some emergency interventions have eroded community coping mechanisms by undermining the local economy of pastoralists. For instance, humanitarian interventions save lives but do not necessarily empower the recipients to carry out alternative livelihoods.
- Programmes do not adequately address the inclusion of women, youth and vulnerable men – that is, they are failing to link activities with the needs of vulnerable groups in responding to the challenges of climate change.

6. Major conclusions and recommendations

This CSA has aimed to contribute to the generation of new knowledge and opportunities for investments in semi-arid areas to help them attain equitable and climate-resilient development. It is also hoped that this CSA's major conclusions and recommendations will shed more light on issues related to PRISE critical research questions. The views expressed during the national and county-level stakeholder workshops are summarised below and corroborate the findings of the CSA.

6.1 Summary of findings of the Country Situation Analysis

This CSA brings out pertinent issues that need attention as follows:

- **Short- and long-term interventions:** Lessons learnt from past interventions addressing climate change impacts mean the pathway for resilience requires the integration of short- and long-term development interventions. There is therefore a need to distinguish adaptation initiatives that enhance community resilience from those that undermine it. This is necessary to avoid the misinterpretation of adaptation strategies for coping with climate change: some strategies (e.g. inappropriate farming) lead to more vulnerability and poverty of ASAL communities.
- **Livelihood diversification:** Pastoralism challenges result from various shocks, both climatic and human-caused, leading to 'autonomous adaptive' strategies, which include livelihood diversification. There is therefore a need to develop local human capacity to take up new

opportunities that will lead to sustainable livelihoods.

- **Natural resource management:** It is not enough to blame poor/weak government policies. Degradation of ecosystem services, loss of diversity and poor understandings of landscape management contribute to resource and land tenure controversies and conflicts. This heightens climate change vulnerability: the government and local governance must address tenure and resource access challenges (e.g. range rehabilitation disincentives) to support the adoption of sustainable land management practices.
- **Economic development:** Investments in conservancies, tourism, infrastructure, value chains, market access and trade need to address the risks and uncertainties arising as a result of the increasing trend of climate impacts. High returns can be met if the private sector and government can venture into joint investments, including in insurance and the rule of law. There are opportunities for economic development in livestock, tourism, dryland agriculture and energy. To enhance resilience, the government needs to invest in human security and physical infrastructure so as to attract the private sector and promote synergy between ASALs and the rest of the country.
- **Poverty alleviation:** Extreme climate events such as droughts and floods have led to the collapse of livestock-based livelihoods and the creation of unintended settlements of communities. Lack of skills for alternative livelihoods for these people and high dependence on

social protection facilities (safety nets) pose a challenge.

Investments in climate-smart dryland agriculture and entrepreneurship should benefit youth in terms of acquiring new skills for alternative livelihoods.

- **The climate change and variability dilemma:** Frequent emergencies mean there is a need for a change of strategy from a humanitarian to a long-term development approach. While not ignoring the need for social protection, policy promoting long-term development needs to provide incentives to those on social protection to transit towards independent sustainable livelihoods. The EDE strategy provides a viable entry point for partnership with PRISE initiatives.
- **Long-term impacts of climate change:** The compounded long-term impacts of climate change will likely see frequent drops and fluctuations in GDP, increased food prices leading to food insecurity, drought-related conflicts and low external investments. This scenario provides fertile breeding ground for social unrest, terrorism and political instability.
- **Integration of climate resilience in economic development:** Short-term interventions dealing with climate-related emergencies need not overshadow long-term development efforts. Climate resilience strategies that address poverty alleviation require the social, economic and political integration of ASALs with non-ASAL areas as a way of creating synergies, national cohesion and political stability.
- **Responding to the impacts of climate change on markets in ASALs:** There is an opportunity

to work closely with the private sector in value addition of livestock and livestock products to ensure a steady supply of livestock commodities (meat and milk). There are also opportunities for promoting cross-border peace agreements to foster inter-tribal and cross-border trade.

- **Impacts of natural resource management policies on vulnerability and resilience critical pathways:**

- Conservation versus poverty: loss of dry season grazing areas to wildlife means a need for mechanisms for livestock–wildlife interface management. There has been growth in the number of community conservancies but benefits are in favour of

the entrepreneur and this can enhance poverty.

- Land fragmentation as a result of land policy that promotes individual ownership of land has led to degradation in some areas. There is also displacement of communities in favour of large projects (e.g. for irrigation), aggravated by land appropriation by large corporations for industrial development, e.g. Tiomin Mining in Kwale and oil exploration in Turkana.
- Unintended consequences of policy: land titling common in higher-potential areas may not necessarily be favourable for pastoral land, as seen in the subdivision of group ranches witnessed in Maasailand.

- **Climate change impacts on demographic changes and human endowments:** Ad hoc settlements and the exploding human population as a result of the influx of refugees from Somalia and the movement of local populations from high-rainfall areas to ASALs means there is a need for a new strategy to mitigate against climate change.

6.2 Recommendations from the PRISE stakeholder engagement workshop

The first PRISE stakeholder engagement workshop in Kenya was held on 27-30 January 2015, and constituted national- and subnational-/county-level consultation. The key recommendations from this consultation are presented on the next page.



Women farmers in Kitui

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Box 1: Summary of views expressed during stakeholder engagement workshop

- **PRISE to incorporate research on the nexus between ecological and social systems:** These two systems are critical for the resilience and sustainability of livelihoods in ASALs. The main challenge here is the question of attribution of impacts. What is the contribution of anthropogenic (social cultural and economic changes) impacts/drivers in comparison with climate change/climate variability/natural variability drivers to livelihood resilience or vulnerability?
- **PRISE research project to identify robust and measurable indicators of climate change impacts:** These indicators are to be closely linked to measurable and distinct impacts of complexity and interactions of long- versus short-term effects on food security, the emergence of new diseases and ecological, social, cultural and economic trend indicators.
- **Influence of the interplay of socio-political factors on local and national governance institutions and how these changes affect livelihood adaptive strategies:** Analysis of local informal and formal institutions and influences on the continued application of indigenous natural resource knowledge practices requires close attention. ASAL institutions are currently fluid as a result of the ongoing devolution process.
- **Factor in private–public partnership approaches:** These approaches include promotion of entrepreneurship; development of infrastructure such as markets, roads and other social amenities; sustainable and equitable utilisation of ASAL resources (renewable and non-renewable); and payment for ecosystem services (e.g. carbon credits), biodiversity conservation and watershed protection and management. The role of the insurance industry in mitigating against climate change vulnerability is a good opportunity to cushion households against the loss of livelihood assets.
- **Address the issue of escalating natural resource-based conflicts in ASALs:** Disputes over access rights to cross-border natural resources are likely to increase as a result of climate change and the unregulated degradation of ecosystem services. It is therefore critical that climate-resilient development integrate a ‘peace for development’ approach. This can be realised by promoting shared development facilities such as water and pastures in cross-border situations.
- **Invest in market infrastructure and access for ASAL communities:** Making markets work for the benefit of ASAL communities is an essential climate-resilient development approach. Value chain analysis of ASAL products needs to be encouraged. For example, the strengthening of livestock-based livelihoods is dependent on the restoration of degraded grazing lands and the protection of non-degraded areas through proper grazing management practices.
- **Mainstream climate resilience and vulnerability reduction strategies in County Integrated Development Plans:** Such a strategy requires the strengthening of county institutions and building human skills and abilities to address climate resilience issues alongside the normal development planning process.
- **Appreciate the synergy created by integrating indigenous knowledge and technologies with modern science in addressing climate-resilient development challenges in dryland communities.**

Stakeholder recommendations on Country Situation Analysis report findings

Box 1 summarises various views resulting from presentation of the Kenya CSA report.

Opportunities and challenges for enhancing adaptation to climate change

Some of the key observations stakeholders made included the following:

- Devolved county governments now have significant resources at local level to invest in climate adaptation strategies and community mobilisation and participation in development.

The demand for massive infrastructure development in ASALs and a lack of interest in enhancing socio-ecological resilience are competing with other essentials in terms of disaster reduction. For example, Kenya's Vision 2030 for the development of the north and other arid lands seems more concerned with ways of bridging the gaps between ASAL and non-ASAL counties, even though the ecological and social contexts of these areas are different and a development pathway to resilience has to be followed. One example of this is the current County Integrated Development Plans, which are supporting land fragmentation and titling to create investment opportunities for the private sector, with the final outcome being a loss of landscape ecosystem services and ecological resilience to climate change and variability.

Research gaps identified by stakeholders

- What factors are constraining the upscaling of good practices in climate-resilient development

and how can this situation be changed to create opportunities to graduate from pilot interventions to effective large-scale programmes?

- What is the relationship between loss of ecological resilience and prevalence of poverty and social disorder/conflicts in ASALs?
- How is urbanisation influencing community organisation in ASALs and what are the scenarios for the next 10, 20 and 50 years? How is *ad hoc* urbanisation in ASALs influencing gender roles, adaptation to climate change and socio-ecological resilience?
- What is the status of social capital (networking and social insurance mechanisms) in sedentarised communities? What are the emerging trends in land and resource tenure arrangements among sedentarised communities?
- How can communities and households address losses of labour for livestock management and losses of indigenous knowledge in the management of natural resources at landscape ecosystem level?
- The sedentarisation of pastoral communities has been equated with losses of livestock-based livelihoods owing to losses of livestock after a drought or as a result of cattle-rustling. This has led the national government and development partners to focus on investing in social protection strategies to assist displaced populations to adopt other livelihood options. How are these interventions affecting the climate resilience and vulnerability reduction of households, communities and countries? To what extent are these measures having negative or positive impacts on household, community and national climate-resilient development approaches?

- To what extent are climate change and socio-ecological changes affecting local governance institutions in ASALs and what will be the possible outcomes/impacts of these changes with respect to options for pursuing pathways to resilient livelihoods?
- What are the trade-offs between various land use options and how do we value the non-market benefits of biodiversity that contribute to overall ecosystem services and human wellbeing in ASALs (e.g. endangered species like sandalwood and aloes and other valuable species including wildlife and their habitats)? What is the relationship between ecological droughts and livelihoods?

Proposed PRISE project sites in Kenya

Consultation during the stakeholder engagement workshop identified the following project sites on the basis of the eco-climatic zones of Kenya as discussed in Section 2.2 of this report.

Makueni and Kajiado counties: semi-arid eco-climatic zone

Final selection here was based on availability of data and previous research work and easy accessibility. Makueni county was selected as it had long-term climate data and a weather station, as well as a widespread agro-pastoral land use system under small-scale farmers. The county also hosts the University of Nairobi dryland field station and a Kenya Agricultural and Livestock Research Organization station. A great deal of research on dryland crop and livestock agriculture has been carried out here for several decades.

Kajiado was selected as the second semi-arid county based on past experience and long-term ecological research done in the county by several organisations. The dominant land use is pastoral production; cultivation of rain-fed crop agriculture is limited. Kajiado has

also undergone rapid changes in land use as a result of its proximity to Nairobi.

The level of land adjudication in Makueni is higher than it is in Kajiado.

Isiolo and Marsabit counties: arid eco-climatic zone

These two counties are about to experience accelerated development as a result of massive road networks that are near completion. They will

experience the impacts of the LAPSSET Corridor project and the movement of populations to new settlements that are emerging along the new roads.

Isiolo county is likely to experience rapid changes because of the influx of new populations in an upcoming new resort city and has very high ethnic diversity compared with Marsabit, which is located along the

Isiolo–Moyale tarmac road. A great deal of research is ongoing, funded by several organisations and development partners including USAID and DFID. Both of these counties have developed excellent County Integrated Development Plans, which will provide the baseline for the PRISE study.

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