



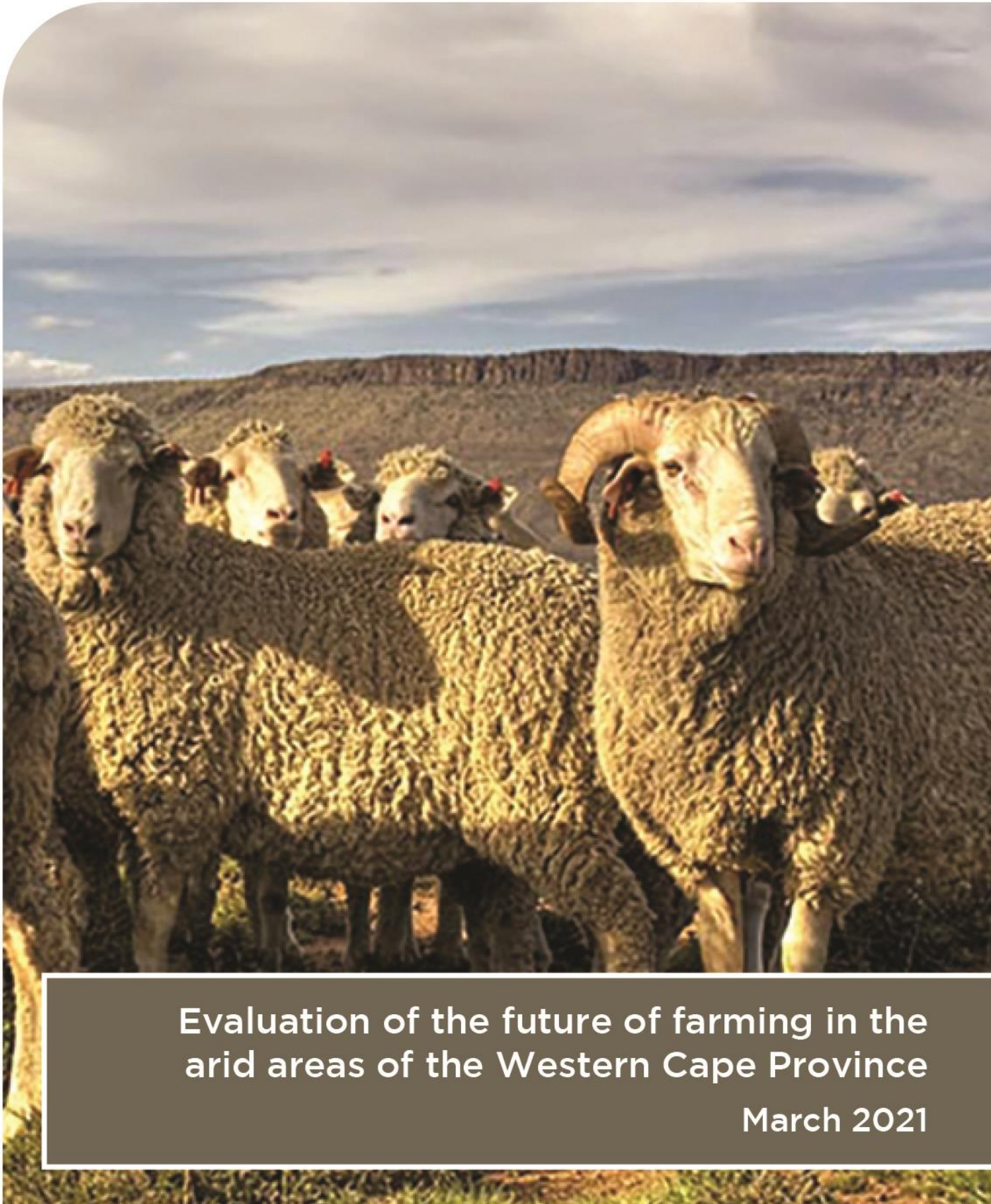
Western Cape  
Government

Agriculture



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**Evaluation of the future of farming in the  
arid areas of the Western Cape Province**

**March 2021**

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## Policy Summary

This evaluation, commissioned by the WC-DOA, has focussed on an examination of how various prevailing and anticipated stressors are set to shape the future of farming in the arid areas of the Western Cape Province, to re-imagine and define an aspirational future-state for these areas and define plausible interventions to make the achievement of this aspirational future possible.

While there are differences across the four arid areas, the evaluation finds the same underlying challenges evident. The analysis of innovations, trends and futures within this realm revealed a range of potential opportunities which can offer the populations in these areas hope for the future. A number of important "black elephants" are also identified - these are defined as the changes that agriculture should see coming and hence should be grappling with, but rather chooses to ignore.

Based on the diagnostic and stakeholder engagement, scenarios of possible future-states were developed and an aspirational vision & goal for the future of farming in the arid areas of the WCP were formulated. A strategic framing was developed to guide the defining of a suite of plausible interventions which can build a more sustainable future of the arid areas. The interventions are clustered into three inter-dependent "Strategic Focus Areas".

The golden thread that runs through the interventions can be described as such: All farmers and landscape managers - empowered with a capacity for innovation, experimentation and adaptation - align their management to safeguard and strengthen the biophysical environment on which they and the region depend. This opens the potential for increased economic prosperity, diversification, inclusiveness. The resulting increased flows of materials and finances within the local economy enhance the human and ecological well-being of the arid areas of the Western Cape will thereby be enhanced. .

It is evident that there are a range of planning structures and mechanisms in place within which potential interventions should be coordinated. In this regard, the interventions should be filtered into the various planning mechanisms (spatial and integrated development frameworks at different scales as well as the Karoo Regional Spatial Development framework (which is currently under development). Where possible, a specific geographical locality has been specified, however, the majority of suggested interventions are applicable across the jurisdiction of the arid areas (e.g., driving innovation, skills development). With a focus on growing local capacity for innovation and local development, it is imperative that there is a strong place-based, cooperative approach to Governance and Policy.

## Executive Summary

Dryland agriculture globally is recognized as being vulnerable to multiple pressures, including climate change, emerging technologies, socio-economic shifts, changed market dynamics, desertification and the degradation of the natural resource base, and are undergoing significant transformation and restructuring. The arid areas of the Western Cape - and the farms, value-chains and communities within them - are particularly vulnerable to these stressors. This evaluation, commissioned by the WC-DoA, has focussed on an examination of how they are set to shape the future of farming in these arid areas and to define an aspirational future-state and the interventions required to make its achievement possible.

Six central themes of change in the four arid areas are identified:

- **Climate variability** has been historically predominant in the arid areas, and this is expected to increase in future. Climate stress, coupled with land-use management practices, has **accelerated ecological change processes**, and resulted in a degraded resource base across the arid areas.
- The two Karoo biomes have experienced **significant shifts in land use**; small stock production and grains production have declined markedly, while the coverage of protected areas and “game farms” has increased. Farm sizes are increasing and there is an increase in “lifestyle farmers”.
- There is a **decline in agriculture’s contribution** to rural economy and maintaining economic viability is increasingly challenging. Ecological and anthropomorphic stressors, declining economic competitiveness and a ‘cost-price’ squeeze are all contributors to this.
- **Social change and marginalisation** is evident with high levels of poverty and unemployment, heavy dependence on social grants and low levels of education. This is compounded by increased movement of people to the local towns.
- **Policy change** post-1994 has resulted in administrative fragmentation and a weakening of integrated development and resource planning/management across the greater Karoo. This has also resulted in the underutilization of Commonage land for social and economic transformation.
- The arid areas continue to be impacted by **technological change drivers**, in general these include the advance of renewable energy and the mining sector, whilst agricultural and other 4<sup>th</sup> IR technologies are set to play an increasingly important role.

In spite of challenges and disruptive forces, the arid areas of the Western Cape also possess a variety of important geographic, historical, ecological, economic and social assets. These can form important ingredients of a re-imagined and aspirational future, and include: Town infrastructure is generally still good; the vast and unique landscape of the arid areas offers an array of economic opportunity; there remains a pool of agricultural expertise and knowledge; agricultural support and other farmer development initiatives and networks are in place; social

services and structures are offered in towns; rural areas and towns have demonstrated and significant tourism potential; an emerging phenomenon of urban dwellers moving to rural areas; and the existence of commonage farmers who may be the commercial farmers in the future.

The evaluation has also sought to identify the “black elephants” – those dynamics and changes that the agriculture should see coming and should be grappling with, but rather chooses to ignore. These are evident across the ecological/biophysical, social, economic and policy spheres, and include: A step decrease in rainfall due to altered climate systems; a collapse of ecosystem function and the services ecosystems provide; growing marginalization of large portions of the rural population; disruptive changes caused by the growth of ‘weekend farmers’; a growing “victim mentality” or sense of disempowerment of farmers; growing dependence of communities (and local economies) on social grants; a looming fiscal cliff for Karoo towns; carbon constrained trade; increases in wildlife and game farming; changed immigration laws affecting the inflow of foreigners and investment in rural lifestyles; slow and poorly implemented land and agrarian reform undermining rural livelihoods; and, misaligned drought relief mechanisms.

Informed by the change drivers, opportunities and black elephants, future scenarios were developed and an aspirational vision & goal for the arid areas were articulated. This was done together with stakeholders representing the four arid areas. The vision and goal so defined are:

**VISION:** By 2050, farmers, farm workers and rural dwellers in arid areas, collectively reaping the benefits of a productive and resilient resource-base, have lives which offer hope and provide dignity, economic prosperity and social inclusion.

**GOAL:** To improve the quality of life of people living in the arid areas of the Western Cape, where the pressures, stresses and shocks experienced can be adequately coped with and recovered from.

An holistic framing (Figure 6) that provides the strategic context to the interventions and which integrates the Economic, Social, Environmental and “Enabling Environment” components of the desired future was developed. A detailed logical framework was then defined (Figure 7) that sets out the specific activities & outcomes and introduces three implementation Strategic Focus Areas (SFA's). From these the proposed “plausible interventions” to achieve the vision were developed:

**Strategic Focus Area 1** is focusses on actions which can underpin and enhance innovation and social innovation processes, and much of what develops under this SFA is foundational for the interventions proposed for SFA 2 and 3. Five specific interventions are proposed under SFA 1:

1.1 Establishment of the structures & networks for a Farmer-led Innovation Program (FIP)

- 1.2 Develop the necessary capacity, skills & resources to facilitate & manage the FIP processes
- 1.3 Support skills development for people on farms and in arid region communities
- 1.4 Support provision of basic infrastructure and services (including "hard" infrastructure and ICT)
- 1.5 Consolidation of knowledge & technologies with potential for integration within FIP processes

Under **Strategic Focus Area 2** we argue for the broad scale adoption of management approaches and practices that support the safeguarding and rehabilitation of ecosystem function across the arid region landscapes. This is premised on the understanding that ecosystem function underpins the economic productivity and social well-being of these regions. 5 specific interventions are proposed under SFA 2;

- 2.1 Develop the knowledge base related to support Regenerative landscape management
- 2.2 Improving Landscape Management in Commonage Areas
- 2.3 Understand changed land use and ownership models in terms of landscape management impacts
- 2.4 Modification of the policy environment to align with & encourage good land management

**Strategic Focus Area 3** speaks to the harnessing of existing and new economic opportunities in the arid areas, diversifying income and supporting income and investment retention locally, drawing on local resources and skills and focusing on local production and value-adding. Four specific interventions are proposed under SFA 3.

- 3.1 Collectively harness the Karoo brand
- 3.2 Enhance the competitiveness of existing economic activities & industries of the Arid Regions
- 3.3 Support new/emerging opportunities for income diversification
- 3.4 Facilitate the development of municipal commonage management institutions

The three strategic focus areas serve as conceptual "hooks" to draw attention, provide clarity and the points of focus for strategy development. For each the outcome being pursued, the rationale behind the intervention, which departments or parties should be responsible to make the intervention, and specific actions that should be included, have been defined.

It is evident that there are a range of planning structures and mechanisms in place within which potential interventions should be coordinated. It is proposed that the interventions should be incorporated within these. Where possible, a specific geographical locality has been specified, however, the majority of suggested interventions are applicable across the jurisdiction of the arid areas. With a focus on growing local capacity for innovation and local development, it is imperative that there is a strong place-based, cooperative approach to Governance and Policy.

## List of Abbreviations

CA	Conservation Agriculture
CDM	Clean Development Mechanism
CMT	Collaboratively Managed Trials
CSIR	Council for Scientific and Industrial Research
DAFF	National Department of Agriculture Forestry and Fisheries
DARDLR	National Department of Agriculture, Rural Development and Land Reform
DBSA	Development Bank of South Africa
DEA-EPWP	DEA Extended Public Works Programme
DEA	National Department of Environmental Affairs
DM	District Municipality
DRDLR	National Department of Rural Development and Land Reform
DWS	National Department of Water and Sanitation
DIRCO	National Department of International Relations and Cooperation
DTI	Department of Trade and Industry
EU	European Union
FMT	Farmer Managed Trials
FIP	Farmer Innovation Program
FOF	Future of Farming
FPSU	Farmer Production Support Unit
FSD	Farmer Support and Development
GI	Geographical Indicator
GIS	Geographical Information Systems
HSRC	Human Sciences Research Council
ICDL	International Computer Driving Licence
ICT	Information and Communication Technology
IGR	Intergovernmental Relation Act
IDP	Integrated Development Plan
JPI	Joint Planning Initiative

KSDF	Karoo Regional Spatial Development Framework
LED	Local Economic Development
LDN	Land Degradation Neutrality Fund
M&E	Monitoring and Evaluation
MSA	Municipal Systems Act
NEMISA	National Electronic Media Institute of SA
NGO	Non-Governmental Organisation
NDP	National Development Plan
OECD	Organization for Economic Cooperation and Development
RE	Renewable Energy
SALGA	South African Local Government Association
SDF	Spatial Development Framework
SFA	Strategic Focus Area
SmartAgri	WC Agricultural Sector Climate Change Framework and Implementation Plan
SPLUMA	Spatial Planning and Land Use Management Act
STR/RED	Small Town Regeneration and Regional Economic Development Initiative.
SU	Stellenbosch University
UBCEG	The Upper Breede Collaborative Extension Group
UCT	University of Cape Town
USDA	United States Department of Agriculture
VCS	Voluntary Carbon Standards
WC-DOA	Western Cape Provincial Department of Agriculture
WC-DEDAT	Western Cape Department of Economic Development and Tourism
WC-EADP	Western Cape Department of Environmental Affairs & Development Planning
WCG	Western Cape Government
WCP	Western Cape Province
WC-DLG	Western Cape Department of Local Government
USB	University of Stellenbosch Business



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## 1. Introduction

Dryland agriculture is recognised as being vulnerable, and under pressure and likely to undergo significant transformation and restructuring. Change drivers, including climate change, emerging technologies, socio-economic dynamics, market pressures and the degradation of the natural resource base underpinning agricultural productivity, are subjecting agriculture to forces that threaten to fundamentally disrupt it. The large and economically important agriculture sector in the Western Cape Province (WC) is subject to these same forces, and the Arid Regions of the Province, by virtue of their structural, biophysical and climatic features, are particularly vulnerable to these stressors.

It is these arid regions which are the subject of this evaluation of the Future of Farming in the Arid Areas of the Western Cape (FOF), commissioned by the Western Cape Department of Agriculture (WC-DOA). This report presents the findings from this study, which aims to present farmers in these regions with options and pathways to achieve desirable and resilient future-states for their enterprises, and, in so doing, assist them in avoiding despair and collapse in the face of mounting impetus for disruption.

### 1.1 Evaluation questions

The overall purpose of this evaluation is to **explore the future structures of farming in the Arid Areas** of the Western Cape Province, with a focus on **reimagining the future** of the agricultural sector in these areas. The evaluation was guided by the following main questions:



a) What are the innovations, trends and trend-breaks that can be identified, researched and described?



b) What are the '(black) Elephants in the Room' that can be identified and described; i.e. which the Agricultural Sector should see coming, but chooses to ignore?



c) What is the range of possible futures for the Sector 30 years from now (2050), that can currently be identified and described?



d) What plausible interventions can be identified to improve resilience in the Sector?

### 1.2 Report structure

Section 2 outlines the methodology, including the literature review approach and stakeholder engagement processes, is described. Sections 3 to 6 present the current trends & opportunities, an overview of how stakeholders perceive farming now and in the future, a description of the "black elephants" and the prevailing policy environment, all of which are relevant to the formulating of a re-imagined aspirational future. Sections 7 to 9 present this future state by way of the scenarios, the

aspirational vision & goal for the arid areas and the strategic framing and logical framework to achieve them. Finally, sections 10 , 11 and 12 detail the proposed interventions, grouped into three “Strategic Focus Areas”.

## 2. Methodology

The study consisted of a diagnostic and design evaluation. Figure 1 outlines the evaluation approach and the various steps of the evaluation. An overarching, multi-method foresight approach, Framework Foresight (Hines and Bishop, 2013), was used to conceptually frame the two evaluation typologies. The evaluation started with an inception meeting and report to clarify the scope of the evaluation, the role of the steering committee (ESC) and the execution of the evaluation.

### 1.3 Diagnostic phase

A comprehensive understanding of the ‘status quo’ of agriculture in the four arid regions was required to inform the next phase of the project (foresight and reimagining phase) and develop future interventions. An extensive literature review was conducted, and the diagnostic was supported by interviews with 44 relevant experts and stakeholders, either from one of the four arid areas, or generally relevant (Annex A: Table 1). A diagnostic synthesis report was compiled to inform the design phase (Separate annexure to the evaluation report).

### 1.4 Foresight and reimagining phase

A baseline future was developed, drawing on findings of the diagnostic. This baseline future was used to elicit stakeholder views regarding different possible futures, which were then analysed using the Three Horizons Framework (Sharpe et al., 2016). Four stakeholder workshops were held (Annex A: Table 2); complemented by six additional stakeholder interviews for informants unable to participate in the workshops. Farmers, government officials and other key stakeholders were invited to online workshops for three locations (Little Karoo, Central Karoo and West Coast), whilst the Tankwa workshop was held as a face-to-face workshop due to limited internet coverage in the area. A synthesis report was compiled (separate report annexure) of the outcomes of the workshops, which included an assessment of how the scenarios were to be utilized in the next phase.



**Figure 1. Evaluation project structure**

### 1.5 Causality and logframe phase and development of interventions

The research team applied the output from the stakeholder workshops to refine the vision for the arid areas. An internal workshop further explored the scenarios developed, and an elaborated description of an aspirational vision and goal for the four arid areas was compiled. The vision and goal formed the basis for the development of a logical framework to identify the activities and intermediate outcomes necessary to achieve the vision. The research team utilized a theory of change thinking approach to guide the development of the logical framework, which formed the basis for the formulation of potential interventions.

Two further stakeholder workshops were held to validate the vision, goal and logical framework, as well as to acquire stakeholder input and ideas for potential interventions required to achieve the goal. Participants were selected from workshops held in the previous phases of the study (Annex A: Table 4). Refinements were made to the vision and logical framework, and the final document here outlines the proposed strategy and suite of interventions developed.

### 1.6 Analysis of (black) elephants

To respond to the evaluation question regarding (black) elephants, the team utilized an understanding of the term as a cross between a 'black swan' (an unlikely, unexpected event with large ramifications) and 'the elephant in the room' (a problem that is clear to everyone, yet remains ignored). This broad definition was used by the evaluation team to identify a range of potential black elephants, presented under a section entitled Unacknowledged Risks. The identification of such was based on a broad assessment by the research team.

## 3. Innovations, trends and trend-breaks and future opportunities?



**What are the innovations, trends and trend-breaks that can be identified, researched and described?**

### 1.7 What are the central trend drivers of change in the arid areas of the Western Cape?

To plan for the future, it is necessary to understand prevailing and anticipated change drivers and how they have and are expected to influence the development trajectory of farming in the arid areas. Six such change drivers were identified:



#### **Climate and ecological change**

Climate variability has been a feature of arid areas historically, and variability is expected to increase in future. Climate change, coupled with intensive land-use practices, has accelerated ecological change processes, and resulted in a degraded resource base across the arid areas. Whilst projections generally point to increased temperature in future, changes in precipitation patterns indicate some variability across the arid areas. There is no long-term trend in winter rainfall regions and a small trend towards more annual rainfall in the summer rainfall

regions (Odoulami et al., 2020). A step change towards less rain is contained in some climate models in the future based on permanent southerly expansion of the regional high pressure systems. This climate change phenomenon has already decreased rainfall in South West Australia and Chile. All arid areas of the Western Cape are experiencing increased evapotranspiration due to the 0.3°C per decade warming trend, rendering them drier.

### **Land use change in the two Karoo Biomes**

Cultivation of wheat and lucerne have declined markedly over the past 50-100 years, whilst goat numbers comprised just 10% of pre-1930 totals. There were approximately 11 million sheep in both Karoo biomes in 1939, compared to just over 4 million in 2007. Analysis of land-use change indicates that 95% of land is classified as natural, and this has been fairly stable since 1990. Vegetation productivity remained unchanged for 90% of land between 1982 and 2015, whilst an increase was observed for 10% of land (in Nama-Karoo biome in locations adjacent to the higher rainfall grassland and savanna environments towards the eastern, north-eastern and northern margins of the biome).

Coverage of protected areas has increased, primarily in the succulent Karoo (8% since 1980). Land-use change analyses indicate that the broader Karoo is in recovery from the significantly higher intensity of land use from first half of the twentieth century and potentially much of the nineteenth century. Decline in small stock has seen an increase in land being utilized for other purposes, such as game farms, and an increase in 'lifestyle farmers'. Notably, average Karoo farm sizes are increasing and the number of commercial farms declining, leading to reduced employment opportunities. The nature of commercial farming in the Karoo is changing, with pressure for the fragile biodiversity to be better protected or conserved, whilst other change drivers by non-agricultural actors are astronomy, renewable energy, potential shale gas and mining (this paragraph draws primarily on findings from Walker et al, 2018 and Hoffman et al., 2018 and Conradie et al., 2019).

Soil erosion in the Eastern Karoo had been on a downward trend since the 1950s due to falling livestock numbers, but has increased in the last two decades possibly due to more intense rainfall events (Msadala and Basson, 2017). Other theories include that week-end farmers and game farming has been coupled with less skill in land management. At one of the few in-field and long term sites of measurement in South Africa, net erosion rates in the Eastern Karoo (precipitation 500mm per annum) are relatively high at 53 to 145 tons/ ha/ yr. Erosion rates at this study site are strongly influenced by rainfall amounts and, in particular, by daily rainfall events which exceed 10mm (Boardman et al., 2015).

### **Agriculture's declining role in the rural economy in the arid areas**

Whilst small stock (and ostrich) historically have provided a source of economic growth, providing jobs and supporting rural livelihoods, the agricultural sector has been in decline and maintaining economic viability is an ongoing challenge. The reasons for this decline are debated, but the contributing factors include urbanisation, the wool industry's decline since the 1950's due to synthetic wool substitutes and declining state support, a lack of technological progress, declining rangeland productivity, social marginalization and remoteness and historical policy effects. Economic competitiveness remains a challenge for arid area farmers, compounded by a 'cost-price' squeeze (rising input costs, falling prices), and may lead to more extensive practices, further compounding the challenges in remaining economically competitive (Conradie et al. (2009); Conradie et al. (2013) & Conradie and Theron 2019).

## **Social change**

Whilst historically, the arid areas have provided a source of economic prosperity, it is notable that following the wool boom, no major economic drivers emerged in the Karoo in the decades up to the democratic transition in South Africa (Nel and Hill, 2008). With little urban and rural investment taking place, and an increasing exit of farmers, farm consolidation has occurred. Financially stronger farmers buying out farms resulted in an increase in people, farmers and farm workers, moving to nearby urban centres. The arid areas remain economically and politically marginalized, as well as 'marginalized in the imaginary of most South Africans' Walker et al. (2018). The current social challenges in the four areas, are however generally similar to areas of South Africa – low levels of education, structural disconnects between the skills available and the skills in growth sectors, difficulty in accessing markets for both inputs such as finance and outputs and infrastructure deficits, all of which leads to a lack of competitiveness, systemic poverty, unemployment and dependence on social grants. Rural centres are regarded as poorly resourced in terms of educational and health facilities. Other social concerns include teenage pregnancy (e.g. Central Karoo had a significantly higher delivery rate for under 18's compared to the WC Provincial rate), high dropout rates from schools, extremely high levels of alcohol abuse and Foetal Alcohol Syndrome and substance abuse (particularly TIK). Walker et al. (2018) state "Looking forward, unless local people themselves become more empowered to shape a future that is socially as well as ecologically sustainable, the prospects for tackling the significant challenges they face appear poor".

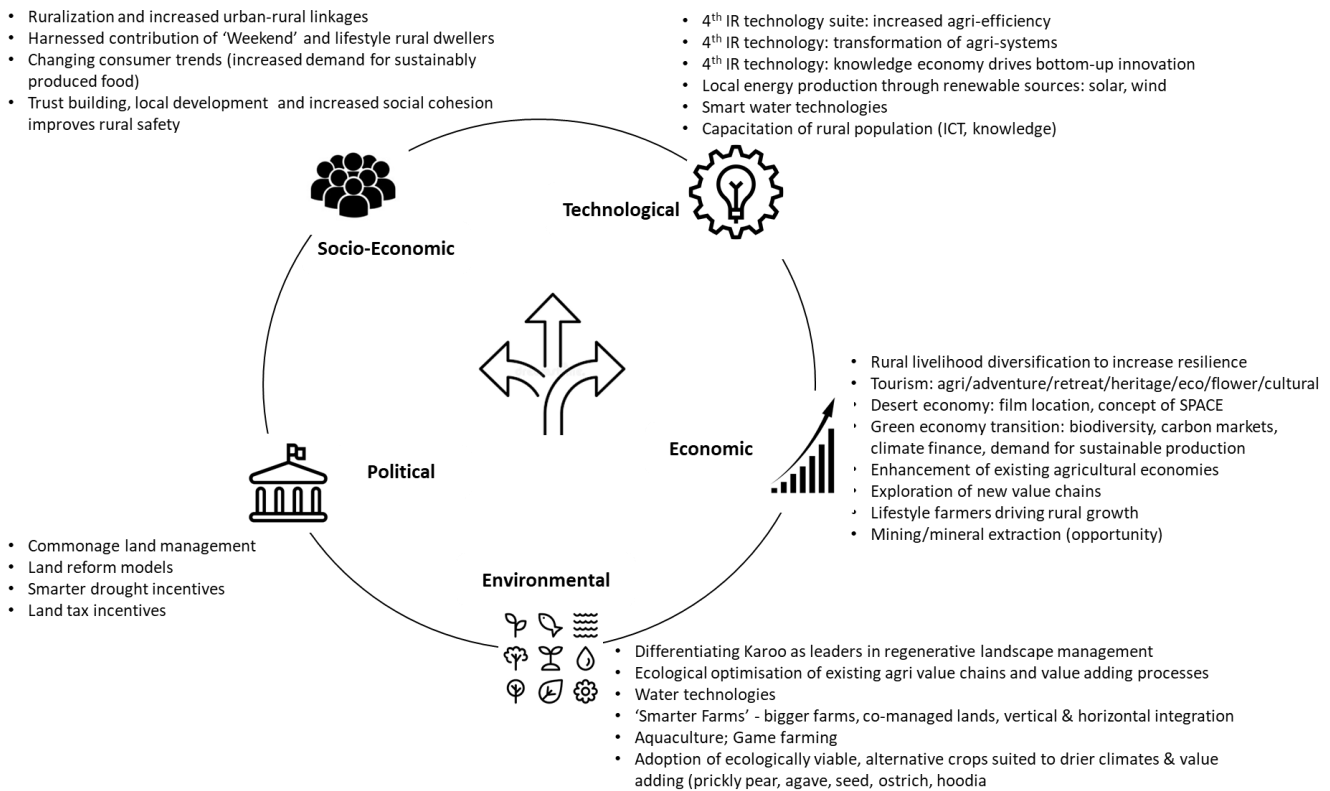
## **Policy change**

Historically, the effects of pre-democracy politics have had a marked effect on land-use across South Africa, and the effects are still evident in the arid areas, for example in land ownership patterns. The dismantling of Apartheid's spatial architecture resulted in a new division of provinces and municipalities which resulted in a small number of very (spatially) large municipalities which has resulted in administrative fragmentation (particularly across Provincial boundaries), which is viewed to have weakened integrated development planning and sustainable resource management across the greater Karoo areas.

Historically, most Karoo towns had publicly owned commonage lands attached to them that came to be leased to white commercial farmers. Post 1994 this category of land was identified as an important vehicle for land reform, and a municipal commonage programme was developed in the late 1990's. It was regarded as innovative, with the potential to provide livelihoods to emerging commercial farmers. However, effective management has proved elusive in many commonage projects, undermining their potential and sometimes resulting in land degradation (Walker et al. 2018).

## **Technological change**

Historically, the advance of agricultural technology enabled the rapid growth of the small livestock sector in the arid areas, where technological innovation such as drilling machines, wind pumps, wire fencing, jackal-proof fencing, new knowledge about stock diseases and the advent of the railway transformed agriculture. More recently, technological advance has globally been a strong change driver in rural areas. In the arid areas of the Western Cape, key technological change drivers exerting an influence include the advance of renewable energy (wind and solar), and in the mining sector. Whilst agricultural technologies, such as remote sensing to monitor evapotranspiration, have been adopted in the arid areas, knowledge of the extent of uptake is limited.



**Figure 2 Broad outline of opportunities for future development pathways in the arid areas.**

### 1.8 What innovations and opportunities can drive future development in the arid areas?

Whilst most of the major trends represent challenges for the development trajectory, the arid areas also possess a variety of important geographic, historical, ecological, economic and social assets which could provide the basis for a re-imagined future. Town infrastructure is generally good (water, sanitation, roads and other infrastructure); the vast and unique landscape of the arid areas offers an array of economic opportunity; and there is a pool of agricultural expertise. A network of agricultural support and other farmer development initiatives is in place and social services are offered in towns. Rural areas and towns have demonstrated significant tourism potential, with niche attractions and activities; and there is an emerging phenomenon of urban dwellers moving to the rural areas, and with this brings in new sources of capital, expertise, ideas and developmental initiative. Finally, there is a pool of commonage farmers, who may be new commercial farmers in the future ((Atkinson and Ingle 2018). Specific opportunities related to the four arid areas are outlined in the review and synthesis reports, whilst an outline of potential opportunities on offer is summarised in Figure 2.



## 1.9 Agricultural technology: Opportunities for futures in dry areas

While it is anticipated that technological disruption of agriculture will take place over a longer period of time compared to other industries, many agricultural technologies are expected to play a significant role in the future, including; crop efficiency technologies, rerouting value chains, biochemical & bioenergy, foodtech and artificial meat, and contained (vertical) farming. The disruptive force of these technologies is being magnified as a result of changing consumer requirements and demands, increasing connectivity and the pressures on food production systems to meet the nutrition needs of a growing global (and urbanizing) population (USB, 2017).

Digital technologies (e.g. smartphones, tablets, in-field sensors, drones and satellites) are already available and utilized in agriculture, providing a range of farming solutions such as remote measurement of soil and vegetation conditions, better water management and livestock and crop monitoring. However, it is notable that the extent of current adoption of such technologies in the arid areas remains limited. Key questions in this regard are: i) which technologies may hold *potential* in the arid areas in future, and ii) how can the adoption of novel technologies occur in these areas (in terms of readiness). These are important considerations regarding planning for the future, and are reflected in the thinking of the intervention planning.

The 4<sup>th</sup> Industrial Revolution assessments undertaken by the WC-DOA (USB, 2017) provide a crucial basis to underpin and drive future innovation and development in the arid areas. It is thus imperative that the drive to increase innovation in the arid areas draw on this work, and that the array of potential future technologies be continually explored, updated and disseminated to rural populations in the arid areas. Relevant and emerging agricultural technologies and their applications, further specified in intervention suggestions, include:

- Smart farming: Precision farming holds relevance for extensive livestock management;
- Blockchain technology: Product identification and management, animal ownership, blockchain also offers considerable potential for digital currency, smart contracts, record keeping.
- Smart water: future advances in desalinization, monitoring technologies, applications include efficiency in use and supply
- Robotics: Contentious (labour loss), yet robotics offer strong potential for improved farm management
- Bioinformatics: Comp. programming analyse data, improve breeding & infectious disease control
- Information and communication technology (ICT): applications include using sensors for more precise farm management, potential is contingent on ensuring access and satellite advances offer strong potential for the provision of ICT to remote areas.
- Sensor technology: Detecting events or changes, for example climate and soil probes, remote sensing for rangeland management and [herd management](#)

- Unmanned aerial vehicles and transport technology: drones – applications include surveying, remote sensing, land assessment, extensive land management; self-driving vehicles, tractors
- Renewable energy: Biomass, wind, solar, thermal.
- Vertical agriculture: Controlled agriculture for local, efficient food production, or production of fodder
- Aquaculture: demand is expected to increase, and technology is improving
- Education and service provision: ICT adoption can transform access to education and services
- Disintermediation: Linking producers directly to consumers, driven by technology (e.g. UBER, [Abalobi](#))

## 4. Farming now and the future: Brief overview of findings

The Three Horizon Framework analysis, drawing on the four workshops and interviews, provided a wealth of insight into farmers and other key stakeholder's views and expectations of the future of the four arid areas. The approach explored the status quo and its drivers, disruptors, ideal futures and competing visions of the future, and elements of the current system which are 'seeds' of the future to retain. The findings of the Three Horizon Framework Analysis were instrumental in informing the future vision and goal as well as the development of interventions. A detailed presentation of findings from the foresight analysis is provided as a separate annexure, whilst general characteristics of the four arid areas in the study are provided in Annex B. Highlights of the findings from the workshops are presented below.

### 1.10 Business as usual: common findings

The first component of exploring futures with stakeholders was to look at the current situation, viewed as business-as-usual and discussing 'how we got here'. Many of the 'business as usual' points were common across the four areas, presented below, while those which were considered as specific in some way to the respective area are presented in Figure 3.

- Drought
- Economically viable farming is difficult, but people survive by doing the right thing
- Poverty and hardship: The situation for farmers is desperate, the toughest times in memory
- Survival contingent on: water for animals, security of feed and capital
- Services low (e.g. electricity, banks, schools) and municipal service delivery challenging
- Substance abuse
- Poor infrastructure (no water/electricity/poor roads/expensive transport)
- Social grants play a pivotal role in supporting lives
- Drought relief programme not focused on drought management, but social survival,
- Veld degradation and/or low carrying capacity
- Decreasing biodiversity, but high endemism
- Tourism is important
- Lowered stocking rates by commercial farmers
- Depopulation and aging population
- Increasing farm security risk, but varied across regions

#### West Coast

- o Limited transformation of agriculture
- o Focus on creating small scale farmers
- o Communal farm lands overpopulated and overgrazed and degraded
- o Seasonal tourism (flowers)
- o Challenging compliance processes for farm workers
- o Increase in weekend farmers
- o Bigger farms trend
- o Theft of plants

#### Tankwa

- o Renewable energy is very prominent in this area
- o Decreasing biodiversity, but high endemism
- o Tourism is important
- o Weekend farming highly prominent
- o Lowered stocking rates by commercial farmers
- o Poaching of plants is an increasing problem

#### Central Karoo

- o Commodity prices are attractive (wool and mutton)
- o New technology helping
- o Insufficient veld needs larger areas vs high infrastructure cost
- o Farms bigger - intensifies labour costs & maintenance costs.
- o Small farms disappeared
- o Tourism remains important but is challenging
- o Game farming has declining importance
- o Increase in Lifestyle farming
- o Waste management an issue with increased urban populations and lifestyle farmers

#### Little Karoo

- o Pre-covid ostrich was still a good earner (external input reliance)
- o Cyclical drought is business as usual
- o Some farms earning and expanding in spite of drought
- o Focus on economic water-use efficiency for irrigated areas
- o Reliance on ground water and flood irrigation
- o Fewer sheep – more goat and Mohair
- o Tourism sector remains good opportunity (eco/- agr- / place based)

**Figure 3 What is business-as-usual: specific to each of the four arid areas.**

#### 1.11 What were the features of aspirational futures described?

- o A more sustainable future, hope
- o Rehabilitated and more productive resource base / greening and rehydrating the Karoo
- o Farming within limits of nature, a balance in number of people dependant on the land
- o Green economy with localized renewable energy
- o Diverse and more resilient livelihoods; rural economic diversification;
- o Greater emotional resilience; underpinned by equitable investment in renewables
- o Empowered local communities
- o Adapted farmers (farmers with the ability to adapt)
- o Sufficient infrastructure and improved service delivery
- o More technology supporting diversified incomes and better lives
- o Tourism (event-wind farm-eco-agri-adventure-space) a prominent feature
- o Increased connectivity: Connected to information and knowledge
- o Practices informed by research and learning, underpinned by appropriate technology
- o Resilient livestock farming
- o Farming with greater economic water use efficiency
- o Greater water availability – infrastructure projects
- o A conducive policy environment
- o Value chains strengthened, where appropriate; Greater value adding locally
- o Focus on younger farmers
- o More social connectedness, farming as a collective; more community; (fenceless)
- o Stronger urban rural linkages (lifestyle/weekend farmers)

#### 1.12 What are the “seeds of the future” in the present

- o Some farmers making a living in spite of the drought – learn from their success, emulate what works

- Lifestyle farming – we need to understand this more and its extent
- Karoo unique biodiversity, heritage and local knowledge
- Emergent paradigm shift and mindset change for early adopter farmers
- Emergent and future technologies being adopted (e.g. Covid sparked remote animal trading)
- Knowledge use and existing research (e.g. ostrich, regenerative practices, soil health, CA)
- Collaborative platforms for knowledge and innovation and a joined up response (e.g. UBCEG)
- Build on existing value chains and examples of value add (Karoo Lamb, ostrich, wool, hides etc)
- ICT being used for on-farm diversification (WiFi business, remote working; technological opportunity and adoption)
- The existing foundation of a strong, diverse and unique tourism offering
- The area has a unique offering of space – rural living; alternative working
- Some supportive policy incentives in place – e.g. drought support
- Strong emergent energy economy, build on an equitable model offering benefit to rural people
- Emergent waste economy
- Mining futures emergent – treat with caution
- An engaged and proactive WC Government

## 5. (Black) Elephants in the Agricultural Room



**What are the (black) Elephants in the Room that can be identified and described; i.e. which the Agricultural Sector should see coming, but chooses to ignore?**

Successful arid area farmers will not be victims of **black elephants**. These farmers will be able to respond to a wide range of difficult to predict contingencies - i.e. **black swans**; and also take cognisance of and counter the known trends currently contributing to a general decline i.e. the **elephants in the room** even when the impact of these is difficult to predict and define. Through the diagnostic and stakeholder engagement process, the evaluation team identified a range of potential **(black) elephants**, outlined below.

### 1.13 Ecological/biophysical sphere

- **Step decrease in rainfall due to altered climate systems**, as experienced in South West Australia and Chile. A long-term decrease in the Western Cape's rainfall has not yet been experienced but remains a feature of many regional climate change models (Otto et al., 2018). Such a change would require detecting followed by the rapid transition to new farming systems.
- **A loss of ecosystem services responsible for nutrient recycling and soil fertility**. Whilst the Karoo has increasing areas under conservation programs (Hoffman et al., 2018) it is already a fundamentally altered landscape, and the potential for sudden losses of biodiversity and ecosystem function remain present.

### 1.14 Social sphere

- **Growing marginalisation of large portions of the rural population**. South Africa's politics has been primarily focused on urban areas since 1994, and there is limited knowledge of contemporary livelihoods and social

conditions of rural populations in the arid areas. This makes it not only difficult to design welfare and economic development policies for this population, but risks their marginalization and even isolation with potentially devastating humanitarian consequences, complete with the scope for populist politics. Marginalisation is compounded by inadequate ICT infrastructure in a digital age. Insufficient is known about the viability of farms and livelihoods in the arid areas.

- **Disruptive changes caused by 'week-end farmers'** in areas. The local discourse suggests there is growing land ownership in the Karoo by city-dwellers who either visit their land at weekends or retire to their land. These landowners typically provide a source of investment and demand for goods and services from small towns that is to be welcomed. However, the longer-term consequences (positive and negative) for employment, land stewardship, social networks and food security remain to be seen, and will prove difficult to monitor.
- **A growing victim mentality.** The idea that current land degradation is the inevitable consequence of historical farming practices (Koster, 2019) and ongoing climate change contributes to the disempowerment and sense of resignation articulated by many farmers during this research. This general sense could have damaging economic consequences, and stands in contrast with the understanding articulated by some farmers that they are active agents in the ecosystem and through their management can improve ecosystem function including soil health, biodiversity, local hydrology and veld condition (Briske et al. 2011).
- **Growing dependence on social grants.** Social grants have provided an essential safety net for rural areas as well as some investment to rural economies. However, related to the point above, growing grant dependence undermines personal agency and identity, and is incompatible with the vision for flourishing arid areas developed in this report, and places an unsustainable burden on the fiscus.

### 1.15 Economic sphere

- **Looming fiscal cliff.** A situation in which all the conditional grants transferred to rural, arid area towns from the central fiscus is spent on salaries and operating expenses is imminent for many of the smaller municipalities. This would leave local authorities and provincial departments with no capital budget to spend on infrastructure and development projects. Existing infrastructure and services would decay, undermining the local economy and further curtailing local revenue collection, leading to a vicious cycle. There are already reports of failing solid waste and sanitation infrastructure in many arid area towns.
- **Carbon constrained trade.** South Africa is a carbon intensive economy and society due to the dependence on coal for both electricity and liquid fuel. IN a world paying increasing attention to climate change, and with the European Union proposing Border Adjustment Carbon Taxes for 2023. Unless South Africa decarbonizes its electricity, and generates new carbon sinks in its soils and forests, this could affect the comparative advantage of agricultural exports from South Africa, and a general loss of competitiveness.
- **Increase in wildlife and game farming.** The trend towards replacing sheep with game, while intuitively good for reversing land degradation (the idea of the land being "rewilded"), appears to be having mixed results (Chesterman, 2009). The longer-term impacts of this trend on land, employment and food security, remains

to be seen, but there are examples of game being associated with accelerated erosion (Boardman et al., 2015).

#### 1.16 Policy related

- **Changed immigration laws affect the inflow of immigrants and investment in rural lifestyles.** These laws could become more restrictive or more enabling. Currently, the difficulty that foreigners experience when looking to live or stay in South Africa for more than three years, is a deterrent to foreign investors. Just as South Africa's dryland areas provided refuge for people from around the world suffering from tuberculosis in the mid-20<sup>th</sup> Century, so too could the dry and pristine arid areas become known as healthy places and spaces for people to live and work in a world afflicted by pandemics. COVID-19 is not the first pandemic of the 21<sup>st</sup> century, [and is not expected to be the last](#).
- **Slow and poorly implemented land and agrarian reform undermines rural livelihoods.** South Africa's land and agrarian reform programme is a key element of the country's restitution for Apartheid-era inequities and quest for a more equal and inclusive society. The future of arid area communities depends on well-implemented land reform programmes. To date, the land restitution, redistribution and tenure upgrade programmes have been slow, contributing to social tension. There is the related risk of settling beneficiaries on marginal or unviable land and without the necessary support.
- **Drought relief untimeously and inappropriately administered.** South Africa administers drought relief when a region is deemed to be a "drought disaster area". Whilst sometimes a lifeline, and complemented by an Agri-SA support fund in the recent drought, the history of drought relief has also seen farmers receive support too late to save enterprises. Other relief has not been linked to drought mitigation measures, occasionally leading to continued overstocking during dry periods and planting in marginal areas.

## 6. Policy alignment and other initiatives

The changes required to ensure a vibrant future in the arid areas requires policy alignment across all three spheres of government and the application of policy instruments in concert. The Western Cape Government operates a Provincial Strategic Plan with 5 "Vision Inspired Priorities" that list items such as "Safe and Cohesive Communities" and "Innovation and Culture" that are crucial to the future of arid areas. The Province is also developing a "Western Cape Integrated Drought and Water Response Plan" that will provide impetus to the ideas forwarded in this study.

Ultimately, these plans will have to enlist the available legislation to enfranchise farmers and guide officials. There is no shortage of legislation available, including the Intergovernmental Relation (IGR) Act 13 of 2005 (the basis for political oversight and coordination IGR structure; inter-municipal cooperation IGR platforms); the Spatial Planning and Land Use Management Act (SPLUMA) 16 of 2013 (enables promulgation of a region and gazetting of a regional spatial development framework); the Municipal Systems Act. No 32 of 2000 & Amend. Act, (MSA) No 44 of 2003 (creates the platform for

municipal technical and implementation entities). The evaluation team are mindful of the importance of these instruments, particularly in terms of incorporating the findings of the current study into planning processes. Due to its significance, a brief overview of a central planning framework for the Karoo is presented below, whilst a more detailed overview of relevant legislation, strategies and plans is provided as an annexure to this report.

#### 1.17 The Karoo Regional Spatial Development Framework process

In 2015, following the commissioning of a Small-Town Regeneration (STR) programme by South African Local Government Association (SALGA), a Karoo STR was initiated. The Karoo STR called for a shift from administrative regions to economic and functional regions. The National Spatial Development Framework specified an "Arid-Innovation Region", and from 2013 to 2017, support was solicited from relevant Provincial and Municipal government to develop a regional spatial development framework for the Karoo. The formulation of the [Karoo Regional Spatial Development Framework](#) (KSDF) is currently in progress, with the stated objective to "*(1) harness the full development potential of the region in a sustainable and transformative way, and (2) address the shared, large scale regional challenges, such as climate change, poverty, inequality, and unequal access to, and participation in the economy*". The KSDF will be an important planning framework to support the implementation of interventions emerging from this evaluation.

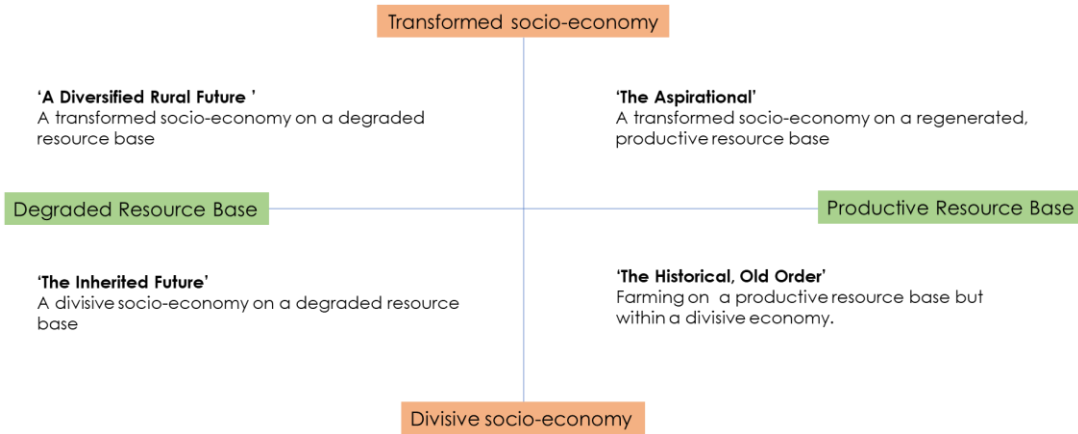
#### 1.18 Western Cape Provincial Strategic Plan

The 2019-2023 plan has 5 vision inspired priorities (Safe and Cohesive Communities; Growth and Jobs; Empowering People; Mobility and Spatial Transformation; Innovation and Culture) that have both informed this study and which can be used to motivate for the recommendations in this study.

## 7. Arid area scenarios

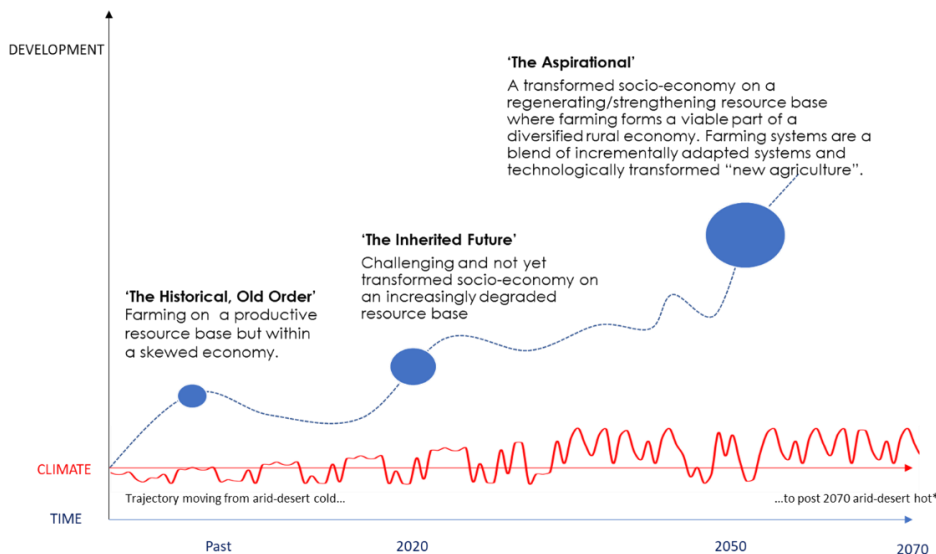
The scenario matrix (Figure 4) developed following the analysis, encompasses a trajectory of development options for the future of the arid areas, drawing on two key axes: socio-economic status and resource base condition. Agriculture and rural development in South Africa has been defined by powerful, historical socio-economic drivers. The socio-economic trajectory depicted is one that is from a divisive and exclusive socio-economy to a transformed one. Whilst this transition is viewed in the future scenarios as being a non-negotiable, it is imperative to acknowledge its importance in how it has, and continues, to define development in South Africa and to include these considerations explicitly in planning for the future.

Whilst it is acknowledged that farming in arid areas is almost always marginal, future development of farming these areas will be defined by the condition of the natural resource base. Historically, and within the confines of the region being an arid and inherently fragile one, there is sufficient evidence to indicate that the arid areas have been highly productive historically, and underpinned regional development and economic growth in the arid areas.



**Figure 4 Scenario analysis locating the trajectory of future development of the arid areas on two key drivers, socio-economy and resource base condition.**

The four scenarios are 'unfolded' into a development trajectory in Figure 5, which provides a future view of how the future might evolve. The 'diversified rural future' (a transformed socio-economy on a degraded resource base) scenario is intentionally omitted, as planning for the future should intentionally circumvent this by working towards the aspirational future. The transition between the phases depicted is not a hard one, there is evidence of the future systems in the current scenario and change will occur incrementally and slowly. The directionality of change is clear from the signals from the past – characterised by the historical and current trends and drivers observed in the analysis.



**Figure 5 Trajectory of development for the arid areas of the Western Cape within a socio-economic and resource base matrix**



## 8. A vision for the future of farming in the arid areas of the Western Cape

Based on the stakeholder input and synthesis from the three horizons analysis, a broadly defined vision and goal for the alternative future of farming in the arid areas of the Western Cape were formulated. The vision and goal specifically seek to articulate a re-imagined and aspirational future for these regions; and assumes a whole-of-society perspective. This broader framing sets the foundation for the identification of specific leverage points and action areas deemed necessary to move towards the fulfilment of the vision and goal. Within the scope of this study, the leverage points relating more directly to farming are explored in more detail in intervention planning.

### 1.19 Vision and goal

**VISION: By 2050, farmers, farm workers and rural dwellers in arid areas, collectively reaping the benefits of a productive and resilient resource-base, have lives which offer hope and provide dignity, economic prosperity and social inclusion.**

**GOAL:** To improve the quality of life of people living in the arid areas of the Western Cape, where the pressures, stresses and shocks experienced can be adequately coped with and recovered from.

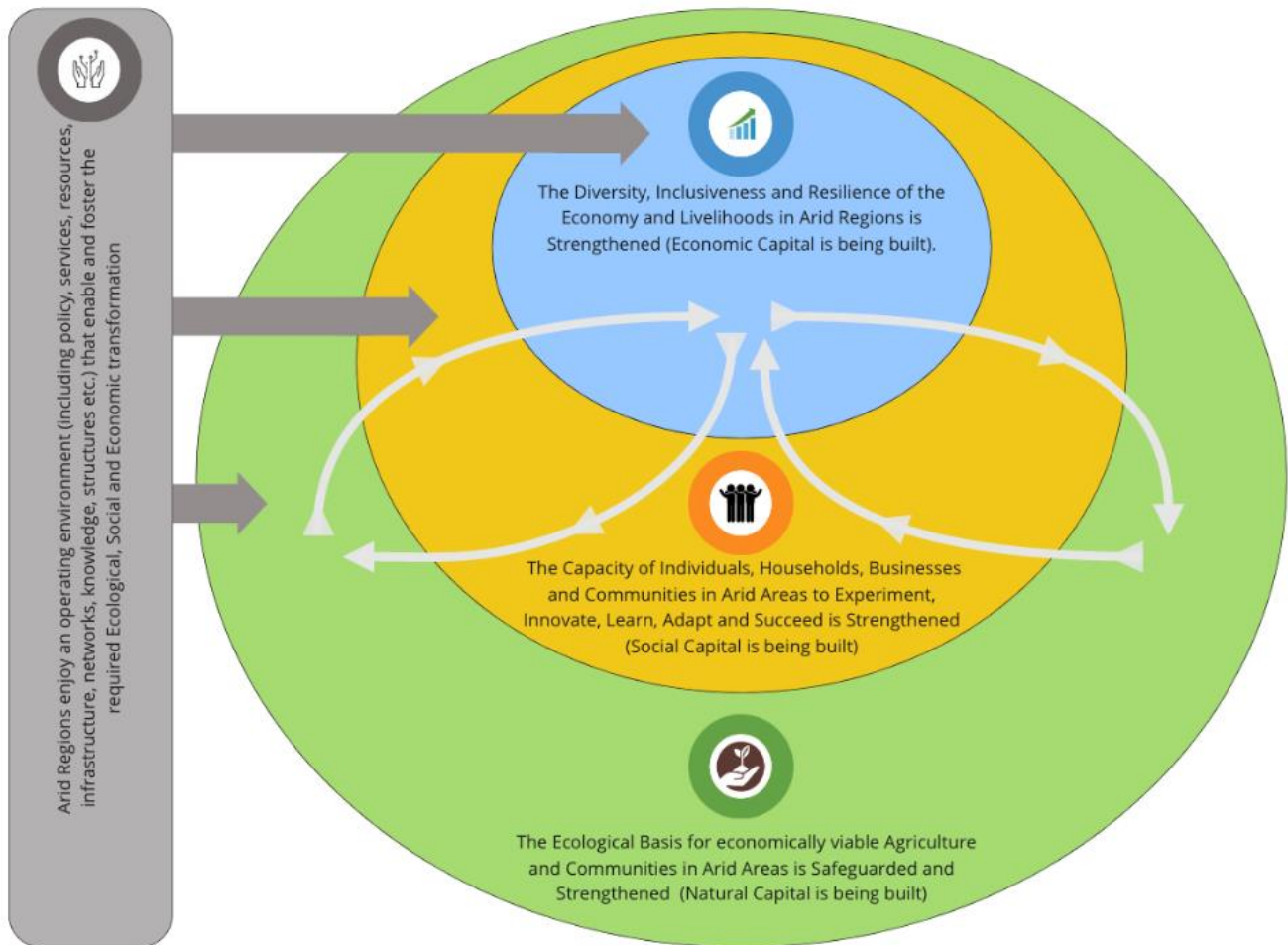
## 9. Strategic Framing of Interventions

While the purpose of this study is to identify interventions necessary to achieving a re-imagined future for farming in the arid regions, it became evident from the analysis and stakeholder input that a broader developmental view was required. This entailed the incorporation and consideration of factors inherently linked to both human development and ecological health. The development trajectory of farming in the arid areas thus cannot be viewed in isolation and must be undergirded by an enhanced enabling environment. This should be directed at supporting the achievement of broad-based positive ecological and social/developmental outcomes in the arid regions, as well as the specific interventions related to agricultural development.

In response to this need, the systems framing presented in Figure 6 has been developed. In this high-level systems view, three inter-dependent outcome areas have been identified, and are supported by a fourth 'enabling context' outcome which is foundational to achieving the other three outcomes. It is from within this framing, that the research team has identified a range of interventions. This framing acknowledges the extent of the broader developmental needs of the arid areas and the arid areas and the bigger system dynamics and interplays that need to be considered as interventions towards the vision are defined and implemented.

## 1.20 Logical Framework

A log frame diagram (Figure 7) builds off this higher-level view and outlines in greater detail what is needed to achieve the four outcomes and, broadly, in what sequence. The holistic framing of the system view and logical framework is important in that it provides the context for interventions to be evaluated. Any intervention, no matter where its primary focus, has to be judged according to its alignment to the achievement of the ecological, social and economic systems outcomes.

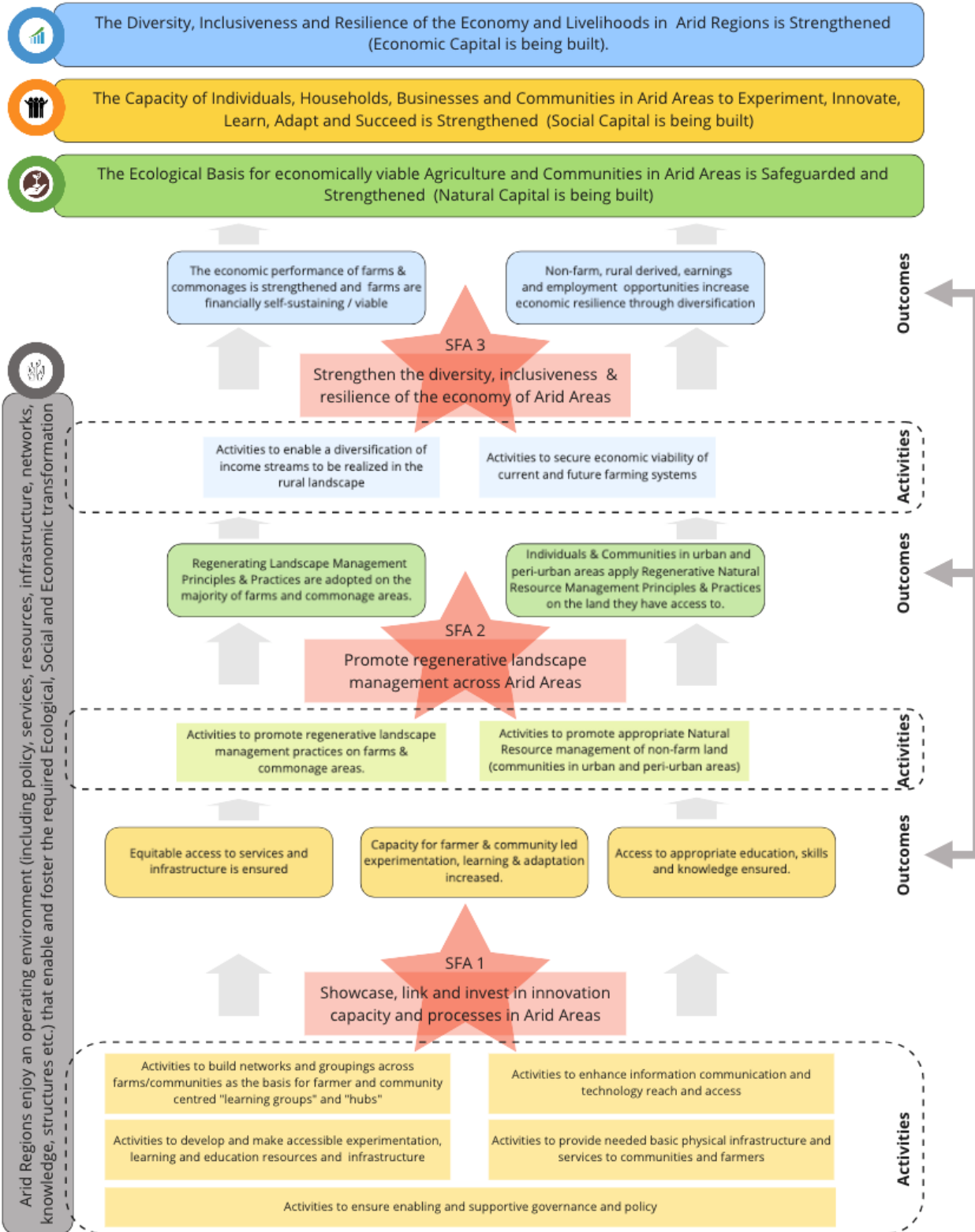


**Figure 6 Four outcome areas required to achieve the future vision of farming in arid areas**

## 1.21 Strategic Focus Areas and Interventions

Within the logical framework, the research team has defined three **strategic focus areas (SFA)** to aid the identification of interventions and actions which are directly in the ambit of agricultural and land-use stakeholders, and to concomitantly identify other action areas which need to occur in concert.

**Figure 7 Logical Framework for interventions**



The three strategic focus areas serve as conceptual “hooks” to draw attention, provide clarity and the points of focus for strategy development :

- Strategic Focus Area 1: Interventions to showcase, link and invest in innovation capacity in Arid Areas
- Strategic Focus Area 2: Interventions to promote regenerative landscape management across the Arid Areas
- Strategic Focus Area 3: Interventions to strengthen the diversity, inclusiveness and resilience of the economy and livelihoods in Arid Areas

Each intervention area and specific actions are presented in the Chapters 10-12. For each, the research team has sought to articulate the outcome being pursued, the rationale behind the intervention (why?), which departments, organisations or parties should be responsible to make the intervention, and specific actions that should be included as part of the intervention. A tabular overview of all interventions is presented in [Annex C](#).

#### 1.22 Guiding principles for developing appropriate interventions (how to succeed)

In order to frame and direct the interventions toward achieving this reimagined future, a set of guiding principles have been formulated. Accordingly, intervention action planning should:

1. Prioritize actions that, as a minimum, halt the degradation of the natural resource base, and which ultimately become pathways to **restoring healthy ecosystem functioning**<sup>1</sup> of arid region landscapes. The ecological resource base is a fundamental component of any future scenario for the arid areas and the ecological state cannot be separated from socio-economic well-being.
2. **Be people centred** and prioritize socially inclusive development trajectories and partnership building, whilst enabling technologically centred development processes
3. Be **knowledge and learning centred** – from the individual level to system level learning for continuous adaptation and improvisation.
4. **Amplify and scale up small wins** - as a first step focus on providing the basic conditions for enabling small ‘wins’, learning from such, and enable amplification of small wins. Identify areas of stagnation and seek to confronting social and cognitive stagnation, or resistance to change, through targeted and counterintuitive interventions.

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<sup>1</sup> Four inter-connected and inter-dependent fundamental ecosystem processes/cycles underpin overall landscape ecosystem health are in view here: the cycling of energy, mineral or nutrient cycling, the water cycle, trophic communities or biodiversity (Ball et al. 2018)

5. Resilience emphasises system buffers, but this is not a luxury that arid area farmers have - instead they have to **prioritise agility** and ensure a focus on **planning for uncertainty**, thereby enabling proactive rather than reactive approaches and offering flexibility in response options.
6. Build **awareness of countervailing forces/interest for land-use** (e.g. mining/rare minerals)
7. Encourage ongoing **monitoring and learning from local to global trends and changes** in broader society – relating to agricultural markets as well as broader societal change processes.
8. Enable the adoption of a **system-wide governance perspective** – the challenges and needs of arid areas demands an integrated planning response.
9. Encourage and create possibilities for **adaptive exploration and experimentation**: Evolving interventions that recognize that change manifests in myriad cultural/cognitive/ behavioural shifts, that will mostly defy any single institution's control.
10. **Be vision-oriented**, with shared visions guiding and inspiring ongoing experimentation, learning and adaptation, co-owned by local actors, “beneficiaries” and sponsors of change, rather than predefined and prescriptive timelines and end-states.
11. **Foster a “smaller bets” approach to risk management**: Shaping probabilities by discovering what is locally possible, desirable, and how it can be scaled. Preventing large scale failures and/or enable localised solutions to continue and spread.

## 10. SFA 1: Build innovation capacity and processes



The Capacity of Individuals, Households, Businesses and Communities in Arid Areas to Experiment, Innovate, Learn, Adapt and Succeed is Strengthened (Social Capital is being built)

Whilst the future challenges facing the arid areas in the Western Cape can in some respects be regarded as unique, rural areas globally are facing very similar generic challenges. There is strong recognition, globally<sup>2</sup>, that the capacity of people in rural regions to innovate is central to securing a sustainable future by re-inventing their role in the economy. Innovation processes are identified as a key factor at the heart of securing a sustainable future for the four arid areas of the Western Cape. Sinyolo et al. (2020) mapped the innovation landscape of the Karoo region, providing important insights into the (limited) extent of innovation in the region. Most districts were at a level of awareness

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<sup>2</sup> For example, the European Union acknowledges future challenges of rural areas and has a very large [rural development program](#) a component of which is a [European Innovation Partnership](#). In the US, addressing a similar need, the USDA has a [Rural Development Innovation Centre](#). In Australia, the revitalisation of rural areas has also received considerable policy attention, where legislation (Desert Australia Act) underpins the [Desert Knowledge Australia](#) platform. In a similar vein, focussing on sustainable rural development, the OECD has launched [a platform](#) to enhance innovation in rural regions.

and acknowledgement of the importance of innovation, yet they found 'little evidence that the municipalities plan to invest in and use innovation to improve LED or identify and implement projects to create jobs or improve economy'.

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*"There is a need to work together as a community of farmers and it is not easy to get outsiders to talk to local farmers"*

*Tankwa Farmer*

*"There is a paradigm shift that is needed with regards to the mindset from the farmers side, and also a need to build relationships with the affected Departments and to strengthen those relationships to see how farmers can be supported in order for a future to materialize"*

*Karoo Farmer .*

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A central question is how innovation can be driven by policy and government action. The Human Sciences Research Council (HSRC) (2013) recommend three immediate policy actions: i. Invest in rural innovations with large and lasting developmental spinoffs for rural communities; ii. Facilitate the construction of resilient and inclusive actor networks to drive catalytic rural innovations; and iii. Develop appropriate measurement tools to monitor, assess and enhance the performance of rural innovation systems to assist the broad spectrum of rural innovators and the innovation research community, to utilise and support these pathways and value chains. The intervention areas outlined below thus place the development and capacitation of actor networks at the heart of what needs to happen.

The first strategic focus area thus focusses on actions which can underpin and enhance innovation and social innovation processes. Much of what would be developed in this SFA is foundational for other interventions. Importantly, innovation in the arid areas must be strongly aligned to the vision and goal, focusing on processes and technologies which also advance ecological resilience. The interventions and specific actions for SFA 1 are outlined below, whilst a detailed elaboration of the actions is presented in Annex D.

**SFA 1: Interventions to – showcase, link and invest in innovation capacity in Arid Areas:**

[1.1 Facilitate the establishment of the structures & networks for a Farmer Innovation Program \(FIP\)](#)

[1.2 Develop the necessary capacity, skills & resources to facilitate & manage the FIP processes](#)

[1.3 Support skills development for people on farms and in arid region communities](#)

[1.4 Support provision of basic infrastructure and services \(including "hard" infrastructure and ICT\)](#)

[1.5 Undertake knowledge consolidation, technology identification and evaluation that has potential for integration within FIP innovation processes](#)

## 11. SFA 2: Promote regenerative landscape management across the Arid Areas



The Ecological Basis for economically viable Agriculture and Communities in Arid Areas is Safeguarded and Strengthened (Natural Capital is being built)

*The true problem of agriculture, and all other land-use, is to achieve both utility and beauty, and thus permanence. A farmer has the same obligation to help, within reason, to preserve the biotic integrity of his community as he has, within reason, to preserve the culture which rests on it. As a member of the community, he is the ultimate beneficiary of both.* ALDO LEOPOLD (2001)

Under Strategic Focus Area 2 we argue for the broad scale adoption of management approaches and practices that support the safeguarding and rehabilitation of ecosystem function across the arid region landscapes. This is premised on the understanding that ecosystem function underpins the economic productivity and social well-being of these regions, that ecosystem function is already degraded, in some cases severely, and that this degradation is in large part the result of current and historical management practices adopted (Milton and Dean, 2015).

Ecosystem function refers to the ecological processes that control the fluxes of energy, nutrients, water and organic matter through an environment. There are agricultural management approaches that seek to generate viable agricultural output while, at the same time, safeguarding and strengthening ecosystem function. Broadly described as Regenerative Agriculture (RA), it encompasses a wide range of farming and grazing practices that are, principle based, "ecosystem-centric" and which specifically move natural resource managers from a prescriptive/formulaic approach to an adaptive management approach. This entails management that is a systems approach, recognizes uncertainty as inherent in natural systems and seeks to learn from it, rather than attempt to eliminate or control it.

Regenerative management practices can broadly be described as those that (i) contribute to generating/building soils and soil fertility and health; (ii) increase water percolation, water retention, and clean and safe water runoff; (iii) increase biodiversity and ecosystem health and resilience; and (iv) invert the carbon emissions of conventional agriculture to one of significant carbon sequestration. In terms of livestock and rangeland management RA includes those grazing practices aimed at stimulating improved plant growth, increasing soil carbon deposits, and overall pasture and grazing land productivity while greatly increasing soil fertility, insect and plant biodiversity, and soil carbon sequestration.

At the heart of regenerative management are the people responsible for managing the natural resource base. Most often this would be farmers but can be any person who directly influences the management of an area. They are the key agents in the system, who, through their management choices - and the thinking, knowledge and understanding that inform these choices - directly determine the well-being of the ecosystems under their management. The shift to the adoption of the

systems approach, principle-based, ecosystem-centric and adaptive farming methods and practices advocated by RA therefore has to be in conjunction with a deeper shift in thinking and understanding, and the acquisition of a new set of management skills by these agents.

The ecological aspirations considered under SFA2 are expanded to emphasize the central and foundational role we place on the ecological underpinnings of the natural resource base to achieving the aspired for Vision & Goal. As such we foresee in a re-imagined future that:

- Arid area farms contribution to the economy and rural livelihoods becomes aligned to the ecological boundaries of the arid area ecosystems.
- New stocking regimes view livestock as an integral part of arid area ecosystems. Improved livestock and rangeland management is underpinned by knowledge, and enabled by increased livelihood diversification, which is anticipated to reduce pressure on land and water resources.
- Conservation agricultural practices become the norm for areas where intensive and irrigated practices are feasible.
- Farming and other land use systems seek to regenerate ecological biodiversity, water cycling, nutrient cycling and energy cycling throughout the ecosystem

SFA 2 therefore proposes interventions that can stimulate/enable this shift in deeper understanding, the emergence of principle-bases, ecosystem centric and adaptive approaches to landscape management (be it for livestock, conservation, crop production or smaller scale food production in peri-urban and urban areas), and the scaling up of the adoption of these approaches. These interventions aim to:

- Build off and scale existing areas of Regenerative management adoption in the arid areas
- To stimulate RA aligned management of commonage areas
- To draw all land uses and owner/manager types (not just farmers) into the adopting regenerative thinking and approaches
- Creating a policy environment that rewards the desired behaviors and practices, while discouraging the less-desirable management practices.
- Aligning Financial services to stimulate the adoption of ecosystem safeguarding/strengthening management practices.

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*"It is time to invite new knowledge to the table and try to develop management practices that is not prescriptive but also provide new insights, tools and technologies to create ecological resilience and regenerative practices"*  
Karoo Farmer

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The interventions of SFA 2 are strongly cross linked to those of both SFA 1 and 3. It is anticipated that the selection, refinement and adoption of Regenerative management thinking and practices will emerge from the social innovation and experimentation processes proposed for SFA1, while the outcome of a safeguarded and strengthened ecosystem function in the arid regions envisaged for SFA2, directly supports the achievement the interventions and outcomes proposed for SFA3 – the achievement of a resilient and inclusive local economy in the arid regions. The interventions and specific actions for SFA 2 are outlined below, whilst a detailed elaboration of the actions is presented in Annex E (linked to from the list).

## **SFA 2: Interventions to promote regenerative landscape management across the Arid Areas**

[2.1 Develop the knowledge base both from local best practice and research output related to the adoption of successful Regenerative landscape and ecosystem management in the arid regions.](#)

[2.2 Improving Landscape Management in Commonage Areas](#)

[2.3 Measures to understand broad-scale land use and land ownership models and to incorporate these within broader programs of safeguarding and strengthening ecosystem function in the arid areas](#)

[2.4 Evaluate opportunities to support the creation /modification of the policy environment related to land management and its impacts on ecosystem function, to reward the desired behaviors & practices / discourages the less-desirable management practices.](#)

[2.5 Evaluate Financial services opportunities to stimulate the adoption of ecosystem safeguarding/strengthening management practices.](#)

## **12. SFA 3: Strengthen the diversity, inclusiveness and resilience of the economy & livelihoods**



The Diversity, Inclusiveness and Resilience of the Economy and Livelihoods in Arid Regions is Strengthened  
(Economic Capital is being built).

A central thrust of the intervention framing is the identified need to build more resilient livelihoods for people in the arid areas by growing and diversifying the rural economy. It is important to emphasize the interplay between SFA3 and the two other SFA's. The achievement of the SFA 2 outcomes (enabled and supported by SFA1) result in the safeguarding and strengthening of the natural resource base which underpins opportunities for a more productive, inclusive and diversified economy, while SFA3 also speaks to the harnessing of existing and new economic opportunities in the arid areas which concomitantly will reduce pressure on agricultural incomes and the natural resource base. It is furthermore viewed as key that measures to grow the economy in the arid areas focus on supporting income and investment retention locally, drawing on local resources and skills and focusing on local production and value-adding. Furthermore, in line with the vision statement, the development of all

future economic activities should strongly align to the principles of a green economic transition, where environmental stewardship underpins planning.

The proposed model is to contribute to the growth of the rural economy in an inclusive manner, focusing on human and social capital development, in acknowledgement of the fundamental social challenges facing communities in the arid areas. Importantly, the interventions outlined below are not viewed as the silver bullet to either the economic or social challenges, rather as measures which, aligned with the holistic context, vision and goal defined above, can contribute to a new economy in

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*““There is also a need to look into diversifying farming operations and that is going to be important, and since we are moving into the green economy which is going to be important in the next 20-30 years.”  
Little Karoo Farmer”*

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future, and in doing so uplift and make more resilient people's lives. The actions also focus on the contributory role which the Government can play in achieving this. The interventions and specific actions for SFA 3 are outlined below, whilst a detailed elaboration of the actions is presented in Annex F (linked to from the list).

### **SFA 3: Interventions to strengthen the diversity, inclusiveness and resilience of the economy and livelihoods in Arid Areas**

[3.1 Collectively harness the Karoo brand](#)

[3.2 Support programs and initiatives aimed at enhancing the competitiveness of existing economic activities/industries of the Arid Regions](#)

[3.3 Opportunities to support new/emerging opportunities for income diversification](#)

[3.4 Facilitate the development of municipal commonage management institutions](#)

## **13. Conclusion**

The evaluation applied a systematic approach to exploring the future structures of farming in the arid areas of the Western Cape. A diagnostic, consisting of a literature review, interviews with experts and local stakeholders, provided a foundation with which to understand the current context of the four areas as well as the historical trends and drivers of change. The same underlying challenge was encountered in each of the four regions: a decline in the economic contribution of agriculture in the face of increasing climate and market pressure, and an inheritance of a natural resource base which has been historically degraded.

Although the development trajectory of each area is similar, there are local contextual differences in production system types (e.g. ostrich in the little Karoo) as well as the extent to which areas have become agriculturally marginalized (e.g. the Tankwa area). Common across the four areas is the future challenges being faced – climate stress, economic pressures, social challenges, poor service delivery and lack of sufficient access to infrastructure. The analysis of innovations, trends and futures within this realm revealed a range of potential opportunities which can offer the populations in these areas hope for the future.

The vision and goal statement provides a beacon which future interventions and activities can work towards. A strategic framing was developed to guide a suite of interventions which can build a more sustainable future of the arid areas. The interventions are to be viewed as areas of opportunity. In compiling the tables, the interventions were exposed to an implicit 'plausibility' test by attempting to define actions required, or possible, to address the myriad developmental challenges facing the areas. The golden thread that runs through the interventions is one in which all farmers and landscape managers, empowered with a capacity for innovation, experimentation and adaptation, align their management to safeguard and strengthen the biophysical environment on which they and the region depend, thereby opening the potential for increased economic prosperity, diversification and inclusiveness and the recalibrate of the flow of materials and finances within the local economy so as to enhance both the human and ecological well-being of the arid areas of the Western Cape.

It is evident that there are a range of planning structures and mechanisms in place within which potential interventions should be coordinated. In this regard, the interventions should be filtered into the various planning mechanisms (spatial and integrated development frameworks at different scales as well as the Karoo Regional Spatial Development framework which is currently under development). Where possible, a specific geographical locality has been specified, however, the majority of suggested interventions are applicable across the jurisdiction of the arid areas (e.g. driving innovation, skills development). With a focus on growing local capacity for innovation and local development, it is imperative that there is a strong place-based, cooperative approach to Governance and Policy.

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## Annex A Stakeholders consulted

Table 1: Individual interview list: stakeholders consulted for the diagnostic

Name and Surname	Organisation	Area
Phyllis Pienaar	WCDOA	Central Karoo
Frans van Wyk	Farmer	Central Karoo
Charlton Japhta	Prince Albert Municipality	Central Karoo
Barbara Koopman	Central Karoo District Municipality	Central Karoo
Simphiwo Piti	Central Karoo District Municipality	Central Karoo
Roland Kroon	Farmer	Central Karoo
James Brodie	Farmer	Central Karoo
Joseph Steyn	Farmer	Central Karoo
Andre Mouton	Farmer	Little Karoo
Passmore Dongi	Garden Route District Municipality	Little Karoo
Piet Klein	SA Ostrich Business Chamber (SAOBC)	Little Karoo
Japie Kritzinger	WCDOA	Little Karoo
Willem Burger	WCDOA	Little Karoo
Dirk Troskie	WCDOA	All areas
Maureen Lekganyane	DALLRD	All areas
Jannie Strydom	Agri WC	All areas
Tommie Bolton	DALLRD	All areas
Natalie Fortuin	Cape Winelands District Municipality	Tankwa
Ilse Trautman	WCDOA	All areas
Helen Davies	DEDAT	All areas
Stephanie Midgely	ACDI	All areas
Peter Johnston	UCT	All areas
Cherryl Walker	Stellenbosch University	All areas
Amelia Genis	Landbouweekblad	All areas
Karin Badenhorst	Private (consultant)	All areas
Marius du Rand	WCDOA	West Coast
Elbe Cloete	Cape Nature	West Coast
Jacobus Smit	Farmer	West Coast
Susanne Carstens	Local resident	West Coast

Rhian van Wyk	Cape Winelands District Municipality	Tankwa
Quinton Balie	Cape Winelands District Municipality	Tankwa
Derek Hobson	Farmer	Central Karoo
Johan Geldenhuys	Farmer	Tankwa
Gerrit van Vuuren	PALS	Tankwa
Neels van Niekerk	Farmer	West Coast
Beatrice Conradie	UCT	Central Karoo
Phil Desmet	Research, independent	All areas
Ashia Petersen	WCDOA	All areas
Sue Milton & Richard Dean	Academic & consulting in restoration	Prince Albert
Hendrik Smith	Grain SA	All areas
Enya Munting	Student and local resident	Tankwa
Ds Herman Burger	Dutch Reformed Church	Central Karoo

Table 2: Workshop attendees per the 4 areas

Name and surname	Organisation	Workshop
Izak van der Merwe	Farmer	Central Karoo
Roland Kroon	Farmer	Central Karoo
James Brodie	Farmer	Central Karoo
Joseph Steyn	Farmer	Central Karoo
Danie le Granque	Farmer	Central Karoo
Japie Kritzinger	WCDOA	Little Karoo
Willem Burger	WCDOA	Little Karoo
Barry Meijer	Farmer	Little Karoo
John Fullard	Farmer	Little Karoo
Lonwabo Luthango	Garden Route District Municipality	Little Karoo
Jan Smit	WCDOA	West Coast
Albert Pool	Farmer	West Coast
Andre Cornelissen	WCDOA	West Coast
Tertius Brand	WCDOA	West Coast
Nelmarie Saayman	WCDOA	West Coast
Tommie Bolton	DALLRD	West Coast
Rudolph Roscher	WCDOA	Tankwa

Hein Lange	Farmer	Tankwa
Andre Vermeulen	Farmer	Tankwa
Johan Geldenhuys	Farmer	Tankwa
Carl Grobber	Farmer	Tankwa
Dennis Solomon	Mainstream Renewable Power	Tankwa
Ralph Dumanse	Genesis Ecoenergy	Tankwa
Monique Schleiss	Afrikaburn	Tankwa
Roger van Wyk	Afrikaburn	Tankwa
Graeme Allan	Afrikaburn	Tankwa

Table 3: Validation workshop attendees

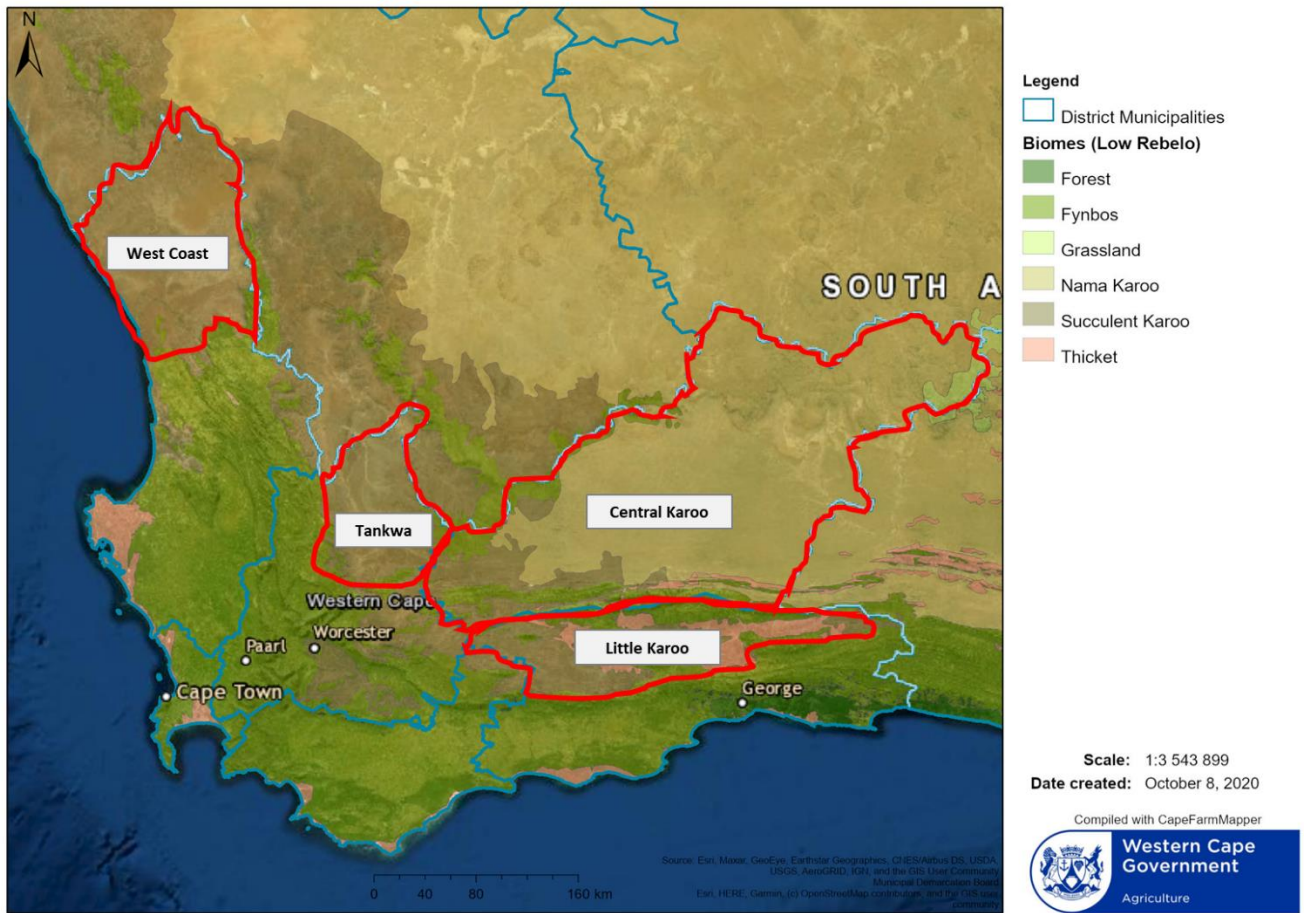
<b>Name and Surname</b>	<b>Organisation</b>	<b>Area</b>	<b>Validation workshop</b>
Francis Steyn	WCDOA	All areas	1
Barry Meijer	Farmer	Little Karoo	1
Roland Kroon	Farmer	Central Karoo	1
Hendrik Smith	Grain SA	All areas	1
Karen Badenhorst	Private (consultant)	All areas	2
Doreen Atkins	Private	All areas	2
Johann Kirsten	Stellenbosch University	All areas	2
Stephanie Midgley	ACDI	All areas	2
Japie Kritzinger	WCDOA	Little Karoo	2
Rudolph Roscher	WCDOA	Tankwa	2
Jan Smit	WCDOA	West Coast	2



## Annex B General characteristics of the four arid areas in the study.

Arid Area	SmartAgri Zone*	Main water resources	Main commodities	Climate Change projections	Future potential
West Coast	Knersvlakte	Almost no storage capacity	Wheat, wine and table grapes, rooibos, sheep, cattle, goats	High range warming	Already very marginal becoming worse
	Hardeveld-Sandveld North	Very low storage capacity, use of groundwater	Wheat, wine grapes, rooibos, potatoes	Medium to high range warming	Increasingly marginal
Little Karoo	Little Karoo	Farm dams, few seasonal rivers, large storage capacity	Wheat, vegetables, wine grapes, stone fruit, olives, dairy, ostriches, sheep, cattle, goats, pigs	Medium to high range warming	Remains moderately high as long as dams fill up
Tankwa Karoo	Tankwa-van Wyksdorp	Medium storage capacity, use of groundwater	Wheat, stone fruit, wine grapes, sheep, goats, pigs, cattle, game, ostrich, dairy	Medium to high range warming	Slowly declining productivity, constrained by heat and water availability
Central Karoo	Koup	Few episodic rivers, medium storage capacity, use of groundwater	Olives, vegetables and vegetable seed	High range warming	Slowly declining productivity, constrained by heat
	Nelspoort	Few episodic rivers, low storage capacity, use of groundwater	Cattle, sheep, goats, ostrich	High range warming	Depends on rangeland changes, constrained by heat and water

Figure: Map of the four arid areas.



## Annex C: Interventions structured per Strategic Focus Area

Strategic Focus Area 1	Strategic Focus Area 2	Strategic Focus Area 3
Interventions to – <b><i>showcase, link and invest in innovation capacity in Arid Areas</i></b>	Interventions to – <b><i>promote regenerative landscape management across the Arid Areas</i></b>	Interventions to – <b><i>strengthen the diversity, inclusiveness &amp; resilience of the economy &amp; livelihoods in Arid Areas</i></b>
1.1 Facilitate the establishment of the structures & networks for a Farmer Innovation Program (FIP)	2.1 Develop the knowledge base both from local best practice and research output related to the adoption of successful Regenerative landscape and ecosystem management.	3.1 Collectively harness the Karoo brand
1.2 Develop the necessary capacity, skills & resources to facilitate & manage the FIP processes	2.2 Improving Landscape Management in Commonage Areas	3.2 Support programs and initiatives aimed at enhancing the competitiveness of existing economic activities/industries of the Arid Regions
1.3 Support skills development for people on farms and in arid region communities	2.3 Measures to understand broad-scale land use and land ownership models and to incorporate these within broader programs of safeguarding and strengthening ecosystem function in the arid areas	3.3 Opportunities to support new/emerging opportunities for income diversification
1.4 Support provision of basic infrastructure and services (including "hard" infrastructure and ICT)	2.4 Evaluate opportunities to support the creation /modification of the policy environment related to land management and its impacts on ecosystem function, to reward the desired behaviors & practices / discourages less-desirable management.	3.4 Facilitate the development of municipal commonage management institutions
1.5 Undertake knowledge consolidation, technology identification and evaluation that has potential for integration within FIP innovation processes	2.5 Evaluate Financial services opportunities to stimulate the adoption of ecosystem safeguarding/strengthening management practices.	

## Annex D: SFA I: Intervention Descriptions

### 1.1 Facilitate the establishment of the structures & networks for a Farmer-led Innovation Program (FIP)

Intervention	1.1 Facilitate the establishment of the structures & networks for a Farmer-led Innovation Program (FIP)
Outcome (s)	Networks, groupings and forums are in place to serve as nuclei for farmer and community led innovation. Strengthening of local capacity through the lens of social innovation can lead to an array of positive developmental outcomes – greater trust, co-action, community strengthening.
Rationale	Research has shown that social innovation processes are a powerful means to drive transformational change when addressing societal challenges <sup>3</sup> (see for example the wealth of examples from a large EU project). There are many examples of social innovation in the literature, for example in Slovakia a self-organised carbon-smart forestry commons group emerged to manage common land better; in Portugal an initiative was developed to co-manage abandoned forest land through goat pasturing. In South Africa, the UBCEG network created by LandCare can be regarded as a good example of a social innovation process to improve collaborative governance to address multiple resource related challenges. Social networking structures and forums are a prerequisite for the farmer-led social innovation processes to occur, and provide a basis for local action and coordination. This differs from area to area and districts within the areas. Building off existing suitable forums is first prize but in some areas the formation of the required forums will have to be facilitated.
Implementer(s)	WCDofA / LandCare
Partners	Farmers, farm workers, Relevant officials for Local Municipalities and District Municipalities, DEDAT, DE&DP; DARDLR, local businesses and ag organizations

<sup>3</sup> An EU Horizon 2020 research project [Social Innovation in Marginalize Rural Areas \(SIMRA\)](#) has compiled [a wealth of examples](#) whilst there is a wealth of knowledge of [how to accelerate social innovation processes](#)

Specific Actions	<ul style="list-style-type: none"> <li>o Identify and assess suitability of existing farmer-centred forums/groupings, including networks in commonage areas, that can serve as hubs for farmer-centred Farmer-led Innovation Program (FIP)</li> <li>o Map relevant NGOs, stakeholders etc in each area, which can be used as a platform to kick these activities off. Use UBCEG as a model for collaboration</li> <li>o Facilitate the construction of resilient and inclusive actor networks to drive catalytic rural innovations.</li> <li>o Develop farmer field-schools and study groups - forums through which best practice guidelines disseminated / used to guide experimentation and adoption within local context</li> <li>o Development of a network of arid area innovation hubs - infrastructure to aid the required networking and exchange of ideas/experimentation etc. in support of the FIP</li> <li>o District Development Models (formulated by DARDLR) for each area outline local initiatives and structures (farmer production support units and agri-hubs). It will be important to link the FIPS with these structures (not all arid areas have local FPSU structures, but some do (e.g. Bitterfontein).</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

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*“Farming as a collective is the only sustainable way of farming in this area. It is doing collective projects and we need to work together as neighbours here in Tankwa. If you look at this area, there is a lot of, but the problem for an individual to develop 1 or 2 hectares is not sustainable and you cannot make a living out of that”*

*“We would like to create as many partnerships as possible”*

*“There is a need to develop previously disadvantaged farmers, but that should be done with existing farmers because if you develop everybody at the same time your impact will be much better”*

*Tankwa Workshop participants*

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### *1.2 Develop the necessary capacity, skills & resources to facilitate & manage the FIP processes*

Intervention	1.2 Develop the necessary capacity, skills & resources to facilitate & manage the FIP processes
Outcome (s)	Networks, groupings and forums are expertly facilitated to serve as nuclei for farmer and community led innovation. Facilitators are equipped with the necessary leadership, technical and action-learning and co-learning

	facilitation skills to successfully initiate farmer and community led innovation processes.
Rationale	Whilst many social innovation examples emerge in a self-organized manner, typically in response to a local challenge, there is scope to, as an intervention, create collaborative learning and networking opportunities. Capacitating and resourcing participants and assisting with convening is central to 'sparking' the process. Capacity to successfully facilitate farmer-led innovation processes is one of the main constraints to these processes as facilitators require technical skills (knowledge of agricultural production systems) but also have to be well versed in action research and co-learning that encourages bottom-up innovation and "ownership" of the process by participants (Smit et al, 2020)
Implementer(s)	WCDDoA / LandCare
Partners	Relevant officials for Local Municipalities and District Municipalities, DEDAT, DE&DP; DARDLR,
Specific Actions	<ul style="list-style-type: none"> <li>○ Develop skills of LandCare and Extension officials in the Social and Scientific skills necessary to establish credibility and to effectively facilitate a farmer-centred action-learning research program (incorporating Farmer Managed Trials (FMT or "Baby" Trials) and Collaboratively Managed Trials (CMT or "Mother" Trials)</li> <li>○ At a locally meaningful scale, refine and share the thirty year vision and goal for the Arid regions that encompasses all role-players (farmers, town, communities). Build off the Future of Farming Evaluation output which provides strong local engagement outcomes of what is needed. This process should include farmers, other rural inhabitants, municipalities and relevant local government officials (using the FIP as a platform)</li> </ul>
	<ul style="list-style-type: none"> <li>○ Establish FIP research fund and governance structure aimed at stimulating farmer-centred research in regenerative management in the arid regions</li> </ul>
	<ul style="list-style-type: none"> <li>○ Establish FIP development advisory board incorporating people with expertise in programs of this nature (particularly farmer-led innovation and action research) as well as subject matter experts (including dryland ecology, ecological rehabilitation, regenerative farming)</li> </ul>
	<ul style="list-style-type: none"> <li>○ Develop FIP farmer-centred research "Participatory Monitoring &amp; evaluation": Develop appropriate measurement tools to monitor, assess and enhance the performance of rural innovation systems to assist policymakers, government departments involved in rural development and innovation, the broad spectrum of rural innovators and the innovation</li> </ul>

	research community, to utilise and support these pathways and value chains.
Geographical area	All four arid areas: Networks are meaningfully localized

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*“We need to draw towards the steps of finding key role players and engage them in new knowledge”*

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### *1.3 Support skills development for people on farms and in arid region communities*

Intervention	1.3 Support skills development for people on farms and in arid region communities
Outcome(s)	Farmers, farm-workers and people living in the arid areas have access to training and upskilling required to access and realise prosperous livelihood opportunities.
Rationale	<p>The future of farming will increasingly demand general and more specialized skill sets, for example digital skill sets and capability. The capacity to support learning and innovation processes is a key source of competitive advantage, a multiplier of economic activity, employment and development. Human capital is therefore essential, and investment in human capital can not only foster the creation of innovation but also, and perhaps most importantly for the remote arid areas of the Western Cape, the assimilation of innovation that is typically produced elsewhere. Given the expectation of a move to a broader rural economy beyond just agriculture, this need extends to other rural sectors, for example renewable energy and tourism.</p> <p>With plausibility in mind, the specific actions thus focus primarily on two core areas within the realm of skills development and which are strongly coupled with knowledge provision (1.5)</p> <p>Adult learners, who have established links in a specific rural locality, are usually less mobile than younger students. Upgrading their skills will thus have a more direct effect on the region's economic performance. Where local initiatives are insufficient, upgrading the skills should be a priority. The provision of programmes should be flexible taking advantage, not only of work based learning, but also e-learning and distance learning opportunities in order to take into account non-traditional learners, those who combine work and study, and the needs of the employers. They also need to allow attendance on the basis of non-formal and in-formal learning.</p>
Implementer(s)	WC DOA (Youth Development, Rural Development, Strategy)), Local Municipalities and Districts – a facilitation/coordination/liason role

Partners	WCG (Thusong and Cape Access); Western Cape Education Department, <a href="#">ICDL (International Computer Driving Licence)</a> ; Microsoft South Africa (partner of Cape Access); Vox Telecom, <a href="#">NEMISA</a> (soon to be the The iKamva National e-Skills Institute).
Specific Actions	<ul style="list-style-type: none"> <li>○ Ensure people living in the four remote arid areas have sufficient exposure and access to existing WC-DOA skills and youth development programs (e.g. Youth Development, Farm Workers) as well as Provincial programs such as <a href="#">Cape Access</a> (where members receive access to computers and computer training, access to job business and research information, internet access etc) and the <a href="#">Thusong Centres</a> (which has an umbrella of rural services including Cape Access). Whilst these centres focus on rural areas, they are located in rural towns – access needs to be promoted through coordination and resourcing local groups to travel (<a href="#">see Cape Access centres locations</a>), or through direct liaison with Cape Access to explore solutions for marginal populations.</li> <li>○ Liaise with <a href="#">Thusong in the Western Cape</a> so that the Department of Agriculture is also represented as a Service Provider, or alternatively is adequately represented in the planning of service offerings of the centres to non-urban rural populations in the arid areas.</li> <li>○ For agricultural skills development (e.g. herding, fencing, windmill maintenance, veld management, basic business management, alien clearing, health &amp; safety, tourism, and other skills in demand, ensure that opportunities for skills development are communicated through network channels in the four arid areas. This can occur through Thusong Centres, but also other programmes (Farm Worker Programmes), <a href="#">Western Cape Government Youth Development Programmes</a> (within each of the four districts).</li> <li>○ Ensure linkages to relevant Agri-hubs and FPSU, outlined in the district development models, to ensure local areas acquire services and training required.</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

#### 1.4 Support provision of basic infrastructure and services (including "hard" infrastructure and ICT)

Intervention	1.4 Support provision of basic infrastructure and services (including "hard" infrastructure and ICT)
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Outcome	People living in remote areas are able to draw on digital technologies to overcome the lack of bulk infrastructure and access new information, new markets and new partnerships, in ways that connect them to the global economy.
Rationale	<p>It is a well-known fact that poor physical infrastructure inhibits rural development in developing countries. The development trajectory is one of weakened infrastructure and declining service delivery, such as water, energy, schools, communications, health services, and financial services. High cost of infrastructure deployment leads to weak demand for ICT services, which further increases the cost of infrastructure and discourages rural businesses, which leads again to lower and declining population. This trend is difficult to address in expansive areas with low population density. It is also evident that the lack of services in the study area has had and continues to have a negative impact on people's lives, particularly farm workers who lack resources to address these challenges. <a href="#">Lack of access to basic communication technology, telephone lines and mobile coverage</a>, is an impediment to local economic development (and the SKA radio free zone has an influence on provision). ICT provides new ways of dealing with disadvantages of remote and peripheral areas. First, it can contribute to reduce costs associated with physical distances. Second, it facilitates access to information. Third, it allows scale economies without proximity. Lastly, it can improve quality of life and services through telework, e-education, health services delivered on the web, etc. These factors may also be considered as new indirect advantages for businesses to locate in rural areas. Uptake of technologies needs to be underpinned by ICT infrastructure, access to technology as well as knowledge. An example of the importance of e-connectivity for agricultural development is efforts made <a href="#">by the USDA to ensure access – and highlight what provision of access can achieve</a>.</p>
Implementer(s)	Municipalities in the four arid areas, WC-DOA plays a facilitation role (there needs to be a driver of digital enablement)
Partners	WCG (Thusong); Microsoft South Africa; Telkom; YahClick; <a href="#">NEMISA</a> (soon to be the The iKamva National e-Skills Institute).

Specific Actions	<ul style="list-style-type: none"> <li>o Support efforts to improve rural service delivery. The <a href="#">Thusong Centres</a> (which have an umbrella of rural services including may be a first option in working out how to effectively provide mobile rural services. Whilst these centres focus on rural areas, they are located in rural towns – access needs to be promoted through coordination and resourcing local groups to travel.</li> <li>o Driving and enabling digital technology adoption (ICT): Google Stations offer fast, free, open access internet to people affected by high unemployment and crime rates in countries. This was launched in metropolitan areas of the WC, but quickly handed over to <a href="#">Think Wifi</a>. The challenge with the remote arid areas is cost of provision, and many of the free platforms utilize existing mast infrastructure (not available in the study area). Internet provision to remote areas needs to be satellite based. Telkom recently entered a partnership with YahClick<sup>4</sup> with the aim of offering satellite broadband services to remote areas. Given the centrality of internet access, effort should be made to facilitate access.</li> <li>o Ensure the four arid areas are adequately represented in Municipal and District level planning with actions such as the Agricultural Policy Action Plan (APAP) which has three pillars: AgriParks, Strategic Integrated Projects (SIP 11) and commodity value-chain development benefit the areas. Other government programmes include the Integrated Strategy on the Development and Promotion of Co-operatives, which is driven by the Department of Trade and Industry (the dti) and DARDLR, and the Extended Public Works Programme (EPWP).</li> <li>o Rural safety and crime prevention Rural safety was flagged in all areas as a risk and a challenge. Trust building in local communities, coupled with including economic development can have a strong impact on improving rural safety.</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

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<sup>4</sup> [YahClick and Vox Telecom](#) have worked together to provide satellite access in the SKA Zone (which is a radio frequency sensitive zone)

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*There is a paradigm that is needed with regards to the mindset from the farmers side, and also build relationships with the affected departments like the department of agriculture and to strengthen those relationships to see how farmers can be supported in order for a future to materialize" Little Karoo Farmer*

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*1.5 Undertake knowledge consolidation, technology identification and evaluation that has potential for integration within FIP innovation processes*

Intervention	1.5 Undertake knowledge consolidation, technology identification and evaluation that has potential for integration within FIP innovation processes
Outcome (s)	Technologies and husbandry practices to embrace a farming future that is unavoidably drier and hotter will be enhanced by research, development and knowledge dissemination. Dedicated arid area research farms/knowledge hubs will produce and package context specific learning, adaptations and knowledge that can complement and be taken up by the farmers-led innovation and experimentation activities. This includes evolving technological opportunities and practices to enhance rangeland condition, husbandry, ways of securing soil moisture, suitable drought tolerant crops, market information, value-adding and applying new technologies that assist arid area farmers with monitoring and evaluation.
Rationale	Future farming in arid areas will require ongoing research and knowledge consolidation. This pertains to incremental development of farming, where adaptive capacity is enhanced through system improvement, as well as to transformational change, where the future will be underpinned by development of new technological opportunities. There is a need to ensure research is available and knowledge provision supports system adaptation as well as to ensure that future opportunities can be embraced by people living in rural areas.
Implementer(s)	WC-DOA
Partners	Local Municipalities, Research institutions,

<p>Specific Actions</p>	<ul style="list-style-type: none"> <li>○ Sharing of knowledge related to agricultural technologies: A recommendation from the 4<sup>th</sup> IR report, <b>WC-DoA to develop a coordinated mechanism</b> which ensures that current and future technology opportunities are shared with people in the four arid areas. The FIP network structures are an important means to enable dissemination to occur. The 4<sup>th</sup> IR study of the WC provides an extensive foundation for this – whilst the basket of technological options should be made available to all, a review of the outputs of this work, through the lens of the arid areas, identified the following potentials: <ul style="list-style-type: none"> <li>▪ Vertical farming as a highly efficient production means (for example of <a href="#">animal fodder as a future option</a>) – this may hold potential for fodder production, in future, for ostriches in the Little Karoo.</li> <li>▪ Blockchain technology – holds considerable potential for product tracing (e.g. Karoo Lamb origin), ownership (for example co-managed herds).</li> <li>▪ Robotics whilst contentious due to replacement of labour, are expected to have a colossal impact on farm operations. In extensive landscapes, labour saving costs (for example for herd management, fencing inspection etc) may drive the advent.</li> <li>▪ Disintermediation has been both a positive and negative global trend which has proved extremely disruptive (e.g. Uber or AirBnB). Technology enabling direct linkage between farmer and buyer, excluding intermediaries can provide strong economic and social benefits. <a href="#">See for example Abalobi</a> (West Coast Fisheries)</li> <li>▪ Renewables (micro and macro) are already present in both forms in the arid areas – future technology improving efficiency and cost can enable improved supply. (Large Scape Renewables covered in SFA 2).</li> <li>▪ Smart Water Technologies: Nine broad water smart technologies are identified in the 4<sup>th</sup> IR review of the WC. The array of these and potential in arid rangeland use must be made clear to farmers in the arid areas.</li> <li>▪ Sensor technologies to improve herd management(<a href="#">for example in the sheep industry in Australia</a>)</li> <li>▪ Unmanned Aerial Vehicles offer efficiency gains (e.g. water management), management (herd monitoring and checking in large areas). Elsenberg has expertise in this area which must be filtered into local knowledge through FIPs.</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>○ Establish demonstration events either on farms or through the existing network of research farms in the arid zones.</li> <li>○ To prepare for local knowledge and learning dissemination for improvement of local farming practices, knowledge consolidation should be undertaken for the following key areas: <ul style="list-style-type: none"> <li>▪ Consolidate SA Data &amp; Research on Dryland Landscape Management &amp; Best Practices – summarise research and best practice as guidance resources for farmer forums – ensure that it speaks to farmer typologies and local needs.</li> <li>▪ Be responsive to the expressed local needs of the four areas</li> <li>▪ Consolidate data from networks of weather stations to get real time/accurate climatic data</li> <li>▪ Clarify water futures – This should focus on efforts to ensure careful future management of groundwater resources and extraction.</li> <li>▪ Need pollinator studies – to improve ecosystem function</li> </ul> </li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

## Annex E: SFA 2: Intervention Descriptions

*2.1 Develop the knowledge base both from local best practice and research output related to the adoption of successful Regenerative landscape and ecosystem management in the arid regions.*

Intervention	2.1 Develop the knowledge base both from local best practice and research output related to the adoption of successful Regenerative landscape and ecosystem management in the arid regions.
Outcome (s)	The social innovation forums developed under SFA1 have available to them compelling evidence from practice and research demonstrating the ecological and economic benefits of regenerative practices, the principles applied and the best practices adopted. These serve to inform experimentation and management practices on farms, commonage land and subsistence producers in peri-urban and urban areas.
Rationale	<p>The transition to ecosystem-centric ways of managing landscapes requires a deeper shift in the understanding and skills of managers. The availability of real world examples from within the same contexts as well as scientific evidence are important contributors to the confidence and capabilities of managers as they make the transition to adopting ecosystem-centric and ecologically literate ways of managing landscapes.</p> <p>Whilst economically successful farming operations in the arid areas are a central element of knowledge networks, it is an imperative to ensure that cases of regionally successful farms are explicitly amplified and learned from. Examples of commercial farms that are operating within ecological limits and making a profit exist in the arid areas: What characterizes them, why are they working and what can be learned and transferred to other businesses?</p>
Implementer(s)	WC-DOA (convene); FIP networks & structures
Partners	University of Stellenbosch, UCT, <a href="#">Cosmopolitan Karoo</a> ; <a href="#">Arid Areas Research Programme</a> (),
Specific Actions	<ul style="list-style-type: none"> <li>○ Identify farmers across the different commodities farmed on both private and commonage lands (including cattle, small stock, vegetable seed and pastures) farmers and other landscape managers (including conservation areas) in each of the four regions who are adopting ecosystem-centric/Regenerative practices /approaches.</li> <li>○ Undertake a process of detailed engagement with each identified party and the development of detailed case studies of each examining their specific contexts, what characterises them, their economic performance, the core principles &amp; practices they have adopted, their key innovations and learnings and benefits achieved.</li> </ul>

	<ul style="list-style-type: none"> <li>○ Consolidate SA Data &amp; Research on Dryland Landscape Management &amp; Best Practices – summarise research and best practice as guidance resources for the social innovation forums – ensure that it speaks to the different farmer typologies and local needs.</li> <li>○ Make this information available to farmers and land managers directly and via the social innovation structures of SFA1</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

## 2.2 Improving Landscape Management in Commonage Areas

Intervention	2.2 Improving Landscape Management in Commonage Areas
Outcome (s)	Commonage areas are managed under collective management arrangements that enable the safeguarding and strengthening of ecosystem function, thereby improving the ecological health, carrying capacity, productivity and economic viability of commonage lands for the benefit of all commonage users and the arid regions as a whole.
Rationale	Commonage areas represent a significant resource for all municipalities in the arid regions and are a valuable asset for development. Many town dwellers look to commonage as a basis for eking out a livelihood. They are also virtually the only land reform option to poor landless agriculturalists (Atkinson, 2005). This results in severe pressure on commonage land compounded by the fact that, as “commons” lands, they are accessed, utilised and managed by large numbers of people. Unlike private land owners, where decision making and interests vest in one or few people, commonage lands are subject to the decisions and interests of multiple people on a shared resource base, making for a significantly more complex and challenging operating environment. In the context of limited municipal capacity to manage commonage areas (Atkinson, 2005) and the complexity of commonage management arrangements, they are subject to over grazing and degradation resulting in loss of carrying capacity and ecosystem function – they are very much subject to a “tragedy of the commons” scenario. Given their geographical scale and their importance as an economic resource to supporting viable livelihoods of many arid area communities, commonage lands are an integral part of achieving the aspired for Vision & Goal for the arid regions. Their inclusion within a broader program seeking to encourage adoption of management principles and practices that are “ecosystem centric” in nature and which are directed at safeguarding and strengthening ecosystem function of commonage landscapes, is thus imperative.
Implementer(s)	Local municipalities, commonage farmers in each commonage area

Partners	LandCare / Farmer Support & Development Programme / Herding Academy
Specific Actions	<ul style="list-style-type: none"> <li>○ Review commonage governance arrangements with a view to securing well-governed common-property institutions that oversee commonage access and utilization.</li> <li>○ Integration of commonage farmers in the Innovation Programs proposed under SFA1 in order to create capacity for people-centered innovation and experimentation directed at farming practices that are regenerative and which.</li> <li>○ Specific training in ecosystem-centric landscape management principles and practices - aimed at building “ecological literacy” of commonage farmers.</li> <li>○ Review potential for collective herd grazing management including implemented cooperation models such <a href="#">as the Landcare Area Wide Planning Project being implemented in the Koup region</a></li> <li>○ Review infrastructure requirements to support more appropriate grazing models (including fencing and watering points).</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

*2.3 Measures to understand broad-scale land use and land ownership models and to incorporate these within broader programs of safeguarding and strengthening ecosystem function in the arid areas*

Intervention	2.3 Measures to understand broad-scale land use and land ownership models and to incorporate these within broader programs of safeguarding and strengthening ecosystem function in the arid areas
Outcome (s)	The use of land in the arid areas other than for agricultural production are identified, defined and understood, and incorporated within the broader program of regenerative landscape management adoption aimed at safeguarding and strengthening ecosystem function in the arid areas.
Rationale	Land use patterns in the arid regions are constantly evolving and different land owners are active in these region who have aspirations for their land that are not purely agricultural. For example large areas of land are being converted from livestock farming to conservation and wildlife ranching, large areas are now managed under renewable energy projects, similarly, the aspirations of owners are also changing, with an increasing number of “lifestyle” or “weekend” farmers in evidence. These changes all carry with them implications for landscapes and their management and, if broad based ecosystem function safeguarding and strengthening is to be achieved, then



	these other land use forms and land owners/managers need to be incorporated within programs to achieve this.
Implementer(s)	WCDOA
Partners	UCT, SU
Specific Actions	<ul style="list-style-type: none"> <li>○ Update/consolidate census data on land ownership and land use in the arid areas – this can draw from research such as Hoffman et al (2018) as well as information databases such as CapeFarm Mapper</li> <li>○ Undertake surveys of land owners to ascertain their primary interest in and aspirations for their land</li> <li>○ Engage land owners into a process to draw them into the social innovation programs and structures of SFA1 and to provide them access to the knowledge resources on regenerative landscape management of Intervention 2.2.</li> <li>○ Synthesise research with the purpose of clarifying the economic and ecological impact of game farming and its future potential.</li> <li>○ Integrated spatial plan for the Karoo – identifying all land use / optimum land management options / account for conservation/farming interface areas</li> </ul>
Geographical area	All four arid areas

*2.4 Evaluate opportunities to support the creation /modification of the policy environment related to land management and its impacts on ecosystem function, to reward the desired behaviors & practices / discourages the less-desirable management practices.*

Intervention	2.4 Evaluate opportunities to support the creation /modification of the policy environment related to land management and its impacts on ecosystem function, to reward the desired behaviors & practices / discourages the less-desirable management practices.
Outcome (s)	A policy environment that encourages and reward land management practices that safeguard and strengthen ecosystem function and which minimize perverse consequences
Rationale	Beyond extension and provision of information to enable adoption of particular practices, regulatory and financial policy instruments can incentivise actions and behaviours to increase resilience, reduce greenhouse gas emissions, improve watershed management etc. These approaches include <i>subsidies</i>

	<p><i>reform, pricing carbon, payment for ecosystem services, and governance improvements, among others.</i></p> <p>Policy and regulations can also have perverse consequences. An example is drought relief, while well intended as support in times of strife, can serve to disincentivise farmers to consider adoption of practices that increase their adaptive capacity, resulting, perversely, in farmers with lower adaptive capacity of their farms receiving drought relief, while those who have developed the capacity to more effectively manage through drought periods not receiving any financial support.</p>
Implementer(s)	WC-DOA to coordinate, local networks
Partners	Local and National Government
Specific Actions	<ul style="list-style-type: none"> <li>○ Review the policy and regulatory frameworks relevant to landscape and ecosystem management to identify gaps, opportunities and challenges to achieving a policy environment supportive of desired practice adoption and outcomes.</li> <li>○ Research new policy instruments that can incentivise sustainable resource management: Payment for Ecosystem Services, Carbon finance models</li> <li>○ Research existing policy instruments to evaluate their impacts on sustainable resource management and how they can be adjusted to avoid perverse consequences and drive desired behaviour (for example challenge current Drought Relief funding - could this be turned into a proactive incentive rewarding good resource management as opposed to "rewarding" farmers who have "failed" to manage their resource base well (i.e who have low resilience?)).</li> <li>○ Within this priority action area: research, knowledge spread, role of drought subsidy and SARS land tax which is used as a subsidy (rebate in tax – this can be used to drive and support sustainable land management practices.</li> </ul>
Geographical area	All four arid areas

*2.5 Evaluate Financial services opportunities to stimulate the adoption of ecosystem safeguarding/strengthening management practices.*

Intervention	2.5 Evaluate Financial services opportunities to stimulate the adoption of ecosystem safeguarding/strengthening management practices.
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Outcome (s)	<p>Financial services to support innovative rural enterprises and improved management practices are explored and accessible.</p> <p>Insurance companies and banks produce new products that assist farmers to make the transitions to practices, equipment and technologies that enhance rangeland management, soil carbon, increase water efficiency, monitor progress more closely and underpin farming resilience. Insurance is no longer seen as a 'grudge-purchase" by farmers, but rather as a way of protecting value due to the well-tailored products</p>
Rationale	<p>Financial or market mechanisms like subsidies or payment for ecosystem services can be effective means to both incentivize action and, for farmers facing financial constraints, remove a barrier to adoption of desired management practices. Adoption of regenerative and sustainable landscape management practices needs to be incentivized. With a global transition to a green economy, it is anticipated that financial instruments to support practices will become more predominant.</p>
Implementer(s)	WC-DOA to coordinate, local networks
Partners	DEA, Development Bank of South Africa, Jobs Fund,
Specific Actions	<p>Review potential alternative financing mechanism for measures to improve landscape management – for example:</p> <ul style="list-style-type: none"> <li>o <a href="#">The Drylands Fund</a>: An innovative initiative for sustaining South Africa's Drylands, housed as an Agency at the Development Bank of Southern Africa.</li> <li>o <a href="#">The Green Fund</a>: A unique, newly established <b>national Fund</b> that <b>seeks to support Green initiatives</b> to assist South Africa transition to a low carbon, resource efficient and climateresilient development path (<b>Green Economy</b>)</li> <li>o <a href="#">The Jobs Fund</a>: The objective of the Fund is to co-finance projects by public, private and non-governmental organisations - significantly contribute to job creation. Labour-intensive activities seek to restore ecosystems, their inherent services and functions can benefit from this fund</li> <li>o The Bioprospecting Trust fund</li> <li>o Furthermore, it would be worthwhile to explore international funds and mechanisms to drive a green transition, for example the United nations Convention to Combat Desertification has <a href="#">a Land Degradation Neutrality Fund (LDN Fund) examples from Denmark</a></li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized

## Annex F: SFA 3: Intervention Descriptions

### 3.1 Collectively harness the Karoo brand

Intervention	3.1 Collectively harness the Karoo brand, drawing out the attributes of the Karoo region that are most compelling to different target markets. This could include an aggregate of existing product (e.g. Karoo Lamb, healthy ostrich meat), place (Oudtshoorn, Prince Albert) and experience (Tankwa trek, Route 62, Afrika Burns) brands.
Outcome (s)	<p>The unique selling point of the Karoo is defined and elevated in the consciousness of different target markets - tourists, researchers, investors – leading to an inflow of visitors and investment. The respective geological, cultural and ecological significance, sense of space, and rural industries become better known and better understood. Rural and urban linkages are strengthened with a heightened appreciation of the respective places and their co-dependency.</p> <p>Dryland farmers are celebrated and showcased across South Africa and in global business communities for their agility and resilience. The respective histories of the arid regions is documented in new and <a href="#">compelling ways</a>, spurring a deeper appreciation of South Africa's diverse history and fresh interest in tourism. Rural towns enrich and communicate their respective histories in ways that celebrate the contributions of all race groups. Towns build commercial and logistical networks based on their shared history.</p>
Rationale	The dryland areas of South Africa offer a suite of lifestyle, food and health benefits that are only partially understood by South African's from outside the region and barely register on non-South Africans. Collating these opportunities in a stronger generic regional brand, and then product specific brands, would assist in raising the profile and allure of dryland farming areas in the consciousness of consumers. This, in turn, may allow business people in dryland areas to integrate up the value chain, returning a greater portion of the consumers "Rand" to the dryland areas.
Implementer(s)	Wesgro and the KRSDF plan
Partners	DAFF, AGRI-WESKAAP, WC-DOA, DEDAT, product co-operatives, municipalities, marketing companies

Specific Actions	<ul style="list-style-type: none"> <li>○ A coordinated effort to brand The Karoo as a “product” is required. Key attributes of the Karoo region are leveraged to develop a unifying concept and brand that enables this unique region to be more effectively and powerfully marketed: Key brand attributes including its history &amp; heritage, natural beauty, open spaces, wildlife, lamb, food, culture &amp; communities as well as the collective efforts to safeguard the Karoo ecosystems – the climate and land stewardship actions defined for SFA2 – are integral to the Karoo “brand”.</li> <li>○ Identify key attributes, events and products that have and could be packaged in a regional brand, and establish the respective appeal and target audiences.</li> <li>○ Invest in smart promotion and marketing among target markets.</li> </ul>
Geographical area	All dryland areas with attention paid to the distinguishing brand features and history of the four respective areas.

*3.2 Support programs and initiatives aimed at enhancing the competitiveness of **existing** economic activities/industries of the Arid Regions*

Intervention	3.2 Support programs and initiatives aimed at enhancing the competitiveness of <b>existing</b> economic activities/industries of the Arid Regions
Outcome (s)	The economic contribution of existing agricultural related economic activities and rural economic activities is improved.
Rationale	The analysis undertaken of the four arid areas indicate that there is i) scope to improve existing economic activity; and ii) a need to ensure that existing economic activities in the four areas are future proofed to ensure they remain relevant in the face of future changes in the four areas. The specific actions outlined below seeks to identify areas where this can be plausibly done for the sub-sectors and existing activities
Implementer(s)	WC-DOA as a convenor/facilitator in conjunction with Local Municipalities and District Municipalities
Partners	Karoo Development Foundation, Karoo Lamb Consortium, Ostrich Industry, Footsteps Foundation. <a href="#">South African Wool Industry</a> ; DEDAT; WESGRO; University of Stellenbosch; UCT; <a href="#">Afrika Burn</a> ; <a href="#">West Coast Tourism</a> ; <a href="#">Central Karoo Tourism</a> ; <a href="#">Little Karoo Tourism</a> ; SANPARKS
Specific Actions	<p><b>Support ongoing efforts to secure future Karoo lamb competitiveness</b></p> <p>OUTCOME: As awareness grows among consumers, the Karoo red-meat industry distinguishes itself from domestic and international livestock feedlots in</p>

terms of quality, animal welfare, bio-security, chemical treatments and human health and carbon intensity. Including GI scheme

ACTIONS: Branding/ GI support: Efforts to secure the branding of Karoo Lamb by securing a Karoo Meat of Origin certification are ongoing and driven by [The Karoo Development Foundation](#) and [The Karoo Lamb Consortium](#). The branding of Karoo Lamb is at a mature stage, and the foundation includes farmers, abattoirs and meat packers. There is opportunity for Provincial Government to offer support to the consortium to help secure the GI is adopted locally, marketing of the Karoo Lamb as well as tackling any regulatory challenges which may be faced. There is furthermore a linkage to 3.1 where the branding of the Karoo nationally and internationally should be strategically planned (for example to international consumers). To do this, WC-DOA should consult the consortium to start a dialogue. Opportunity further exists to disseminate technologies (e.g. blockchain) and best practices to holders of the certification.

Sector efficiency (covered in SFA2): Consideration can be given to supporting a sector initiative, [for example Australia's Sheep Industry Business Innovation Project](#)

**Support efforts for a strategy for a sustainable future ostrich sector (Little Karoo)**

OUTCOME: The economic contribution of the ostrich sector is harnessed and a future strategy to secure its future is in place.

ACTIONS: In spite of severe covid-19 disruption and disease, the ostrich sector remains important in the near and medium term, given ostriches climatic adaptability. A potential threat is climatic impact on fodder production, and water is identified as a key future factor.

Branding: Ensuring strategic positioning of the ostrich market internationally (Halal, healthy, sustainable (?))

Production: Explore new technologies for more efficient fodder production (vertical farming for fodder, genetics)

Value adding: Explore further value adding to improve sector resilience.

**Support efforts for local value add of South African wool**

OUTCOME: The Chinese created a market for wool and import all grades of wool from SA. Efforts are being made to recover the local wool market, for example [The Footsteps Foundation](#) has the aim is to make use of the existing factories and add value to the product in the different small towns.

ACTIONS: Support ongoing efforts to strengthen the broad ecosystem supporting local value add is retained. For example, a wool cluster has been

	<p>registered with the DTI and is awaiting funding. A key action is to engage the wool sector for specific support areas.</p>
	<p><b>Ensure tourism is embedded and supported in farmers and local development strategy</b></p> <p>OUTCOME: Farmers and local communities harness the significant potential which the Karoo holds (the tourism potential is outlined in detail in the literature review).</p> <p>ACTIONS: There are many stakeholders driving tourism to varying degrees in the four arid areas, and all four areas hold potential due to various unique selling points. Whilst there is a wide array of stakeholders in this space, a key and focussed action is to <b>channel measures to enhance tourism opportunities at the local, farm or community level</b> (building capacity through the FIP networks to enable people to develop products, improve revenue from existing tourism including product development, tourism marketing, tourism skills and development. tourism support infrastructure, tourism research and information. Inspiration for packaging of information resources for agricultural communities, including successful cases <a href="#">can be found in the USDA's support to the recreation economy guide</a>.</p> <p>At a regional scale, regional branding is important for the general marketing of the Karoo's many USPs, and links strongly to a well-coordinated and aligned branding initiative. Inspiration can be drawn from successfully branded areas (for example the R62) with a view to amplifying/emulating in other areas.</p>
	<p><b>Harness the weekend farmers role more explicitly</b></p> <p>This is outlined in SFA2, however, once a deeper understanding of the 'weekend' farmers is gained, actions should focus on ensuring their role and contribution to the local community is optimized, for example through inclusive local engagement.</p>
Geographical area	All four arid areas in general, or as specified above.

### 3.3 Opportunities to support *new/emerging opportunities for income diversification*

Intervention	3.3 Opportunities to support <b>new/emerging opportunities</b> for income diversification
Outcome (s)	New economic activities with a strong future potential are identified, and planned for inclusion in local economic development.
Rationale	There are a number of emergent opportunities for new economic activities, derived from the rural areas, to be developed in the four areas.

	The specific actions outlined below seeks to identify areas where this can be plausibly done for the sub-sectors and existing activities
Implementer(s)	WC-DOA as a convenor/facilitator in conjunction with Local Municipalities and District Municipalities
Partners	Renewable Energy companies (e.g. Genesis); ReNu Karoo; Farmer Angus; Credible Carbon; Operation Phakisa: Aquaculture, DALRRD, Private Sector Actors (e.g. <a href="https://www.vikingaquaculture.co.za/">https://www.vikingaquaculture.co.za/</a> ); Aquaculture Association of Southern Africa Aquaculture Stewardship Council; CSIR Environmental Management Services; Department of Agriculture, Forestry and Fisheries (DAFF): Aquaculture and Economic Development; Department of Environmental Affairs; Operation Phakisa: Aquaculture; South African Institute for Aquatic Biodiversity; South African National Biodiversity Institute
Specific Actions	<p><b>Ensure renewable energy benefits the local communities and economy</b></p> <p>OUTCOME: Renewable energy developments in arid areas provide an alternative livelihood option for rural dwellers and offer the opportunity for upskilling and meaningful employment. Funds generated by renewable energy companies' community trusts is equitably reinvested in local communities.</p> <p>ACTIONS: There is an increasing number of renewable energy developments in the arid areas. Renewable energy developments in arid areas provide an alternative livelihood option for rural dwellers and offer the opportunity for upskilling and meaningful employment. Funds generated by renewable energy companies' community trusts is equitably reinvested in local communities. <a href="#">OECD has developed a useful guidance document for this</a>. What can be done specifically?</p> <p>Ensure that the renewable energy community representative is linked to a local community forum to discuss needs and have an ongoing dialogue regarding trust reinvestment, local upgrading, skills development, employment.</p> <p>Ensure that Local Municipalities are included in Forums.</p> <hr/> <p><b>Ensure the potential of carbon markets and PES markets is fully utilized by dryland farmers</b></p> <p>OUTCOME: South Africa implemented a carbon tax in 2019 with the first payment due in October 2020. The tax allows for between 5-10% of a liable company's emissions to be offset through registered carbon mitigation or carbon sequestration companies. As of October 2020 only projects registered under three international standards – VCS, CDM and Gold Standard – were eligible to submit carbon credits as offsets, under the carbon tax. Efforts are</p>



underway by DMRE to create a system for approving local carbon trading standards under the tax.

Credible Carbon, South Africa's oldest and most active carbon registry is not yet registered under the Carbon Tax, but nonetheless sold 1.3 million tCO<sub>2</sub> in 2020 including "soil carbon" credits from a high density grazing project on Spier farm in the Western Cape. A number of conservation, grazing and afforestation (including spekboom) projects are hoping to benefit in a similar way, but are currently constrained by the lack of scale, support and a local standard.

While soil carbon in arid areas tends to be quite low and labile (it can be lost during a drought) potential exists to combine conservation agriculture techniques with the generation of carbon credits and enhances soil fertility.

ACTIONS: Future economic mechanisms will increasingly be defined by the transition to a green economy. Participation in carbon markets (and potentially in future markets rewarding payments for ecosystem service) represent an opportunity for farmers to benefit economically through improved management practices ([see for example Spier](#)). The question, given the nature of the arid areas landscape, is what the potential is for **tapping into carbon markets in these landscapes**. It is an opportunity worth exploring, given the current degraded state, coupled with the large extent of land. Regional differences according to rainfall regime as well as localized management practices will determine the feasibility. The suggested action here is to ensure that this avenue is explored as a means to incentivize and reward farmers for improved rangeland management.

#### **Aquaculture development along the West Coast**

OUTCOME: Expansion and adoption of aquaculture opportunities along the West Coast are explored

ACTION: **Aquaculture** has been identified as one of the key priorities in DAFFS 5-year strategic plan; a Chief-Directorate responsible for aquaculture management has been established and The National Aquaculture Strategic Framework (NASF) has been finalised. **Strandfontein-Lamberts Bay** is identified as a strategic mariculture area. This is a clear opportunity to explore investment and development opportunities along this coastline and which can benefit local communities

#### **Sustainable production and sale of local Karoo Succulents**

OUTCOME: Production of local succulents for ecological services can support local communities.

ACTION: Local demand beyond the arid areas, as well as potential demand of the back of increased efforts for landscape regeneration can enable an opportunity for local nursery production of plants. [See ReNu Karoo for](#)

	<a href="#">example</a> whilst LandCare/DEA&DP have had a similar initiative in the Berg and Breede River Catchments, coupled with EPWP projects.
Geographical area	All four arid areas: Networks are meaningfully localized

### 3.4 Facilitate the development of municipal commonage management institutions

Intervention	<b>3.4 Facilitate the development of municipal commonage management institutions</b> to support the efficient, equitable and sustainable use of municipal commonage in support of local economic development and land reform .
Outcome (s)	Municipal commonage is put to work in terms of accelerating access to land and supporting livelihoods for people that cannot, yet, afford freehold land. Adequate investment of time and resources secures well-governed common-property institutions that secure efficient, equitable and sustainable commonage access. The co-operation and partnerships required to run these common-property institutions sustainably yield new business opportunities for resource-poor farmers. Structuring of future farm businesses in municipal commonage lands acknowledges the ecological constraints of arid area systems, and are geared to support the safeguarding and strengthening of the shared natural resource-base.
Rationale	<p>Commonage lands represent a significant opportunity to support rural development and land reform, but ensuring this opportunity is exploited efficiently, equitably and in a manner that ensures sustainable use, requires a set of enforceable rules regarding who can access, extract-from and invest in the area (Ostrom and Hess, 2010). This set of rules includes what can be expected from DAFF and the municipality, respectively. Creating and maintaining these rules will involve ongoing input from farmers, ecologists and municipal officials, as well as the formation of a commonage management entity. Forging this governance capacity will require ongoing investment in convening the stakeholders, conducting the research enhancing the commonage resource.</p> <p>South Africa requires a range of tenure options to make its land reform programme work. Publicly owned commonage lands are available and have been identified as resource that could be used in land reform (Atkinson and Benseler, 2002). Municipal commonage projects were initially regarded as innovative; however, common property institutions and sustainable and equitable land management practices have proven difficult to create and</p>

	<p>sustain, leading to elite capture of the commonage resources and land degradation due to an under-investment in land.</p> <p>Commonage lands are subject to “tragedy of the commons” scenarios playing out (see Intervention 2.2) and management institutions are key to ensure more coordinated management of the shared resource base. Optimal natural resource management strategies need to be place (and rainfall) dependent and users of municipal commonage should be encouraged to experiment with innovate as part of the farmer-led innovation and experimentation proposed in SFA1.</p>
Implementer(s)	Municipality
Partners	DALRRD (including veterinary), WC-DOA (LandCare), Herding for Health, Local abattoirs, PALS
Specific Actions	<ul style="list-style-type: none"> <li>o Identify the extent and ecological state of the available commonage (including soil analyses as a baseline) as well as what is already taking place on this commonage.</li> <li>o Identify “subsistence”, “emerging” and “proto commercialists” farmers seeking access to the commonage, and agree a common property regime for access and use of the commonage (Atkinson and Benseler, 2002).</li> <li>o Embed the commonage use regime in municipal bylaws.</li> <li>o Integrate commonage farmers within the FIP processes outlined in SFA1 and directed at achieving the outcomes defined for SFA2.</li> </ul>
Geographical area	All four arid areas: Networks are meaningfully localized